A·I·B·S

bulletin

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EDITORIAL

The Call of Biology

H. J. MULLER

Indiana University

IF YOU PREFER an "academic life" as a retreat from reality, do not go into biology. This field is for the man or woman who wishes to get even closer to life as it is, both in its squalor and its splendor. Such a person is likely to feel keenly his own kinship with his fellow beings of all kinds, and to be attracted by their variety, intricacy and exuberance. He sees that beneath their manifold conflicts and their seeming chaos there lurk deeper meanings, and hidden harmonies. He seeks to discern these meanings, to find out how living things have come to be what they are, and by what means, both natural and artificial, they may become reshaped again. Man cannot properly understand his own nature, nor intelligently guide his own future, without far more insight that he yet has into the living world of which he forms so upsurgent a part.

So vast are the breadths and depths of the community of life on this earth, in its forests and fields, waters and soils, and so deviously branched and tied together are the processes connecting the different lives with one another, as well as those within each individual life, that they afford almost inexhaustible room for perpetual exploration. The range of choice in such work is boundless. For many generations yet there will be plenty of scope for those who prefer the free, rambling ways of old-style outdoor nature study, and also for those, increasingly disciplined, who want to inquire by more systematic observations and tests into the interrelations and behavior of wild things. For those wishing to investigate the individual himself in detail, there is a peculiar fascination in the exploration of other minds than ours. In fact, all lines of physiology, till recently centered so largely on what happens in creatures like ourselves, present enlightening contrasts and amplifications when studied in quite different types of animals, plants, and microbes.

Another great series of fields is that concerned with how the individual unfolds during its lifetime, with the way its parts coordinate with one another in its growth, with its powers of regulation and regeneration of members, and with its final decline. This work is becoming ever more analytical, as well as capable of wider control over the events it studies. Here too different organisms allow attacks to be made from widely different directions. Underlying all such inquiries, and dealing with even more fundamental problems, are the probings into the biological basis of inheritance. These would seek out the way in which the inner core of living matter, the determining material which is passed on from one generation to the next, clothes itself in each generation with its protoplasmic accouterments, on the one hand, and, on the other hand, manufactures likenesses of itself and thereby implements the seeming miracles of growth and reproduction.

He who wishes to perceive the pattern of long-range change, and to learn more about the principles governing it, has in some ways the most integrative work of all to do. Although a knowledge of the life of past ages will greatly help this type of biologist, the evolutionist, he should also be in touch with the important finds in all the investigations into the living things of today. In particular, he must study the behavior of the hereditary material. A bent for mathematics may help him here, in gauging the outcome of long continued operations on the basis of short range findings.

Most important of all, as biology advances, will be its continual reformulation in terms of chemistry, physics and mathematics. Biochemistry especially will come into its own, since at bottom practically all operations in living things consist of biochemical changes. For this reason the progressive young biologist should start early to get a firm foundation in chemistry. Nevertheless, there are still enormous fields of biological work in which present biochemical methods are less useful than those on the biological level. In some fields, in fact, biochemistry itself is becoming the debtor to biology.

Many persons who do not intend to devote their lives to biological research or teaching will find that a considerable study of biology will add to their appreciation of their own subjects. This is obvious for such fields as medicine, bacteriology, agriculture and even some lines of geology. Moreover, the enhanced perspective and insight derived from their biological study will often serve to guide them regarding the more distant consequences of their practices.

Aside from these more direct applications, biology is today essential to every man for his attainment of a modern outlook on the world he lives in, and on his own place within it. The theory of evolution, made more intelligible by genetics, and taken together with modern advances in embryology, physiology and biochemistry, has opened men's eyes to an entirely different and far larger world, with incomparably greater possibilities of change, than our ancestors of only a century ago looked out upon. In order to adjust to these altered significances of life and to utilize these enormously expanded opportunities for it, the general public must have its eyes opened to the essentials of this new understanding. Unfortunately, our grade schools and high schools, and even some of our colleges, have thus far proved themselves lamentably backward and afraid in undertaking this task of enlightenment. Here then is one important field of endeavor open to today's student of biology. Its pursuit is a means whereby man may ultimately be enabled to raise himself ever higher above his present level.

As in most careers devoted to the advancement and dissemination of knowledge, the monetary rewards are not great, since the gains are seldom salable by the person who achieves them for his private profit. But those who choose to make this sacrifice will, in return, get what money cannot buy: a free pass into the marvelous world of terrestrial life-forms, in all its million-fold variety, its billion-year history, its illuminating significances and its dark mysteries. No matter what the drudgeries involved in their daily lives, their entry into this larger realm affords them a legitimate escape from their petty affairs, into a greater reality. In roaming within this world, the biologist's work becomes his play, and he approaches that ideal of unification with nature to which the sages of all peoples have aspired.

Across the EDITOR'S DESK

• **The Southwestern Association of Naturalists** was formed at an organizational meeting attended by fifty-two persons at the University of Oklahoma Biological Station at Lake Texoma on May 23, 1953. As stated in the constitution, "The object of the Association shall be to promote the field study of plants and animals, living and fossil, in the Southwestern United States and Mexico, and to aid the scientific activities of its members." SWAN hopes to stimulate the study of the region by bringing together persons of like interests through publication of annotated membership lists, annual meetings, and perhaps later through the publication of a journal. Officers elected for the first year were: W. Frank Blair (Vertebrate Zoology) University of Texas, *President;* George J. Goodman (Plant Taxonomy) University of Oklahoma, *Vice-President;* Herndon G. Dowling (Herpetology) University of Arkansas, *Secretary-Treasurer.* The geographic scope of the Association at present includes Mexico and the states of Arizona, Arkansas, Kansas, Louisiana, New Mexico, Oklahoma, and Texas. Persons interested in the natural history of this region are invited to join the Association. Membership blanks may be obtained from any of the officers.

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• Upon the recommendation of the Chairman of the National Research Council, the **Secretary of State appointed the following official delegations to represent the United States at international scientific meetings** held during the past summer: *Fourteenth International Congress of Zoology:* Karl P. Schmidt, Chicago Museum of Natural History, Chairman; E. R. Hall, University of Kansas; E. R. Mayr, American Museum of Natural History; Gotthold Steiner, U.S. Department of Agriculture; and Emil Witschi, State University of Iowa; *Eleventh General Assembly of the International Union of Biological Sciences:* Paul Weiss, University of Chicago, Chairman; Ralph E. Cleland, Indiana University; and H. Bentley Glass, The Johns Hopkins University; *Twelfth International Congress on Limnology:* G. E. Hutchinson, Yale University, Chairman; David Frey, Indiana University; and Ruth Patrick Hodge, Philadelphia Academy of Natural Sciences; *Ninth International Congress of Genetics:* C. P. Oliver, University of Texas, Chairman; Ralph E. Cleland, Indiana University; R. Goldschmidt, University of California; Francis Ryan, Columbia University; W. R. Singleton, Brookhaven National Laboratory; and Don Cameron, U.S. Department of Agriculture; *Sixth International Congress for Microbiology:* R. E. Buchanan, Iowa State College, Chairman; Stanley F. Carson, Oak Ridge National Laboratory; Harry Eagle, National Institutes of Health; and James Reyniers, University of Notre Dame.

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• **A Two-Year Postdoctoral Fellowship** to study a program of **Science and General Culture** is being offered at the University of Pennsylvania. The closing date for applications is February 1, 1954 and the fellowship will cover the period 1954-56. A stipend of $8,000 for the two years will be augmented by an allowance for travel. The first year will entail a study of the place of science in general culture with specific reference to American Civilization. The second year would include further studies in this same field plus experimental advanced courses and undergraduate and graduate programs in American Civilization. Inquiries should be addressed to: The Chairman of the Committee on American Civilization, Box 66, College Hall, University of Pennsylvania, Philadelphia 4, Pennsylvania.

• For the first time the ***International Botanical Congress,*** which will be held in Paris from July 2-14, 1954, **will include a section exclusively devoted to Phycology.** The preliminary program of these meetings will include: (1) comparative cytology of algae applied to classification; (2) biochemistry of algae applied to classification; (3) morphology and development of algae—particularly life cycles and classification of Chlorophyceae; (4) ecology, floristics and geographical distribution of algae (marine and fresh-water). The following phycological excursions are planned: A. *Before the Congress* (last week of June). (1) Marine. Along the Côte des Albères (Mediterranean Sea) at the Laboratoire de Biologie marine de l'Université de Paris in Banyuls-sur-Mer. (2) Freshwater: In Auvergne at the Laboratoire biologique de Besse en Chandesse de l'Université de Clermont-Ferrand. B. *After the Congress* (from July 15-21). (1) Marine: Along the Coast of Britanny in the Channel—at the Station Biologique de Roscoff de l'Université de Paris, including, if possible, an excursion for fresh-water algae in inner Britanny and a visit to a Manufacture for production of iodine and algine from algae. (2) Fresh-water: To subalpine Lakes around Aix-les-Bains at the Laboratoire d'Hydrobiologie de L'Ecole Nationale des Eaux et Forêts du Lac du Borget.

Phycologists who intend to submit communications to the Congress are kindly requested to send to the secretaries of the Section of Phycology before Jan. 15, 1954, a brief summary (written in English or French) not exceeding 5,000 letters or spaces for original communications connected with the program of the meetings or 2,000 letters or spaces for sundry communications. All matters concerning the Section of Phycology and the phycological excursions should be addressed to the Secretaries of the Section: (Marine Algae): Prof. J. Feldmann, (Fresh-water Algae) Dr. P. Bourrelly, Institut Oceanographique, 195 rue St. Jacques, Paris 5 eme, France.

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• **The National Science Foundation will award individual grants to** defray partial travel expenses of **a limited number of American plant scientists** who will attend the 8th International Congress of Botany to be held in Paris, France, July 2-14, 1954. Blanks whereby applications for grants may be made, may be obtained from the National Science Foundation, Washington 25, D. C. Completed applications must be returned to the Foundation by January 1, 1954 in order to permit time for evaluation and processing. Announcements of the travel grants to be awarded will be made in March 1954.

Initial selection of botanists to be awarded travel grants will be made by a selection committee representing all major areas of plant science, to be elected by the botanical societies of the American Institute of Biological Sciences. Final selection of grantees will be made by the National Science Foundation.

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• On July 17, 1953, the **National Science Foundation announced grants** to the following individuals for work in various aspects of biology: M. Gusinde, Catholic University of America; J. R. Preer, Jr., University of Pennsylvania; F. H. Westheimer, Harvard University; G. E. Hutchinson, Yale University; M. J. Pelczar, University of Maryland; F. R. Blood, Vanderbilt University; Walter H. Hodge, Silver Spring, Maryland.

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• The **following publications** may be purchased from A. H. Wright, 113 E. Upland Road, Ithaca, New York: I. Agassiz and Cornell. Studies in History No. 15, $1.35 Paper; II. Letters (1863-1874) to Charles Frederic Hartt. First Professor of Geology at Cornell University—A cross-section of the Agassiz Period. Studies in History No. 16, $1.35 Paper; III. Cornell's Colors—Carnelian and White. Studies in History No. 17, $0.30 Paper.

• A fifteen-page bibliography of **"Free and Inexpensive Materials for Conservation Education"** can be secured from the National Association of Biology Teachers for ten cents. The bibliography was prepared by Muriel Beuschlein of Chicago as a part of the three-year Conservation Project being sponsored by the Association. Copies can be secured from the Project Leader, Richard L. Weaver, P.O. Box 2073, Ann Arbor, Michigan. There is a twenty-percent discount on orders of 100 or more. Materials listed are from private, industrial and governmental sources.

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• The Florida State Museum has completed negotiations with the U.S. Department of the Interior, through the National Park Service, to carry out a **biological survey of the lower Chattahoochee and Flint River Basins.** The National Park Service has made available a grant of $1500 for the work. The survey will involve the study of animals and plants found in territories which will be inundated by the construction of the Jim Woodruff Dam on the Appalachicola River. J. C. Dickinson, Jr., Curator of Biological Sciences at the Museum, will direct the field work which is already in progress. In addition to staff members from the Museum and the Department of Biology at the University, field work has been carried out by T. H. Hubbell and Paul Kannowoki, University Museums, University of Michigan; W. J. Clench and Miss Ruth Turner, Division of Mollusks, Museum of Comparative Zoology, Harvard; Ralph Yerger, Department of Zoology, Florida State University; and Roland Hussey, Florida Southern College.

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• **The New York Society of Electron Microscopists** has begun to issue a bibliography, on Keysort Cards (3.5″ x 7.5″), of the world literature in all fields of electron microscopy. The first issue covering the years 1950, 1951 and 1952 (approximately 700 cards) is now available. This undertaking, supervised by a trained bibliographer, has drawn upon the exceptional library resources of the New York area. Wherever possible, the material was examined to achieve accuracy of reference and adequate analysis of subject content. Begun in February 1952 and continued in 1953 by means of grants from the Lillia Babbit Hyde Foundation, the continuation of this work is assured by the combined support of the Farrand Optical Company, the North American Phillips Company, the Optical Film Engineering Company and the Radio Corporation of America. The circumstances of its preparation make it possible to offer the bibliography for sale at very nearly the cost of reproduction. UNESCO coupons accompanying the orders from abroad will be recognized. Further information may be obtained from the Society, at The New York Academy of Sciences' Building, 2 East 63rd Street, New York 21, N. Y.

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• Four research bacteriologists who carried on a ten-year search for a series of new antibiotics known as Pyos *(Pseudomonas aeruginosa)* received the **1952 Commercial Solvents Award in Antiobiotics** at the annual convention of the Society of American Bacteriologists held in San Francisco in August. The award, which consists of a gold medal, $1,000 and engraved scrolls, was presented to Ibert C. Wells, Edwin E. Hays, E. A. Doisy, and William L. Gaby. The group was selected for the honor by the Commercial Solvents Award Committee of the Society of American Bacteriologists for research started at St. Louis University in the early days of World War II. These investigators have demonstrated that, in addition to pyocyanine, one of the earliest known antibiotics, *Pseudomonas aeruginosa* produces several other antibacterial agents; they have worked out methods of isolation, separation, and purification of these agents; defined their physical and chemical properties; proposed structural formulae for them; and, by degradation and synthesis, proved the acceptability of the proposed formulae.

• Within recent months efforts have been under way to increase exchange of information in the field of **tissue transplantation** among investigators in laboratories and those at the bedside. The USPHS sponsored a small conference which took place in October 1952 at Arden House, Harriman, New York. At this conference workers in plastic surgery, cancer, zoology, and other fields discussed common problems in tissue transplantation. In March, 1953, the Ciba Foundation sponsored a similar conference in London, England which emphasized the "Preservation of Normal Tissues for Transplantation." Participants at both conferences felt that some means should be provided for further continuous exchange of information on an informal basis among investigators in the clinic and the laboratory interested in problems of tissue transplantation.

To meet this need, it is proposed to issue a quarterly ***Transplantation Bulletin.*** This Bulletin will serve several functions: it will maintain, and publish at least once yearly, a transplantation Registry which will list all practicing physicians and research workers, both in the United States and abroad, interested in transplantation problems. The Registry will cover the fields of plastic surgery, endocrinology, cancer, genetics, immunology, experimental morphology, etc.; it will provide a medium for a rapid and informal exchange of information on problems and progress in the clinics and laboratories both here and abroad. It is emphasized that the Bulletin will not publish formal papers. However, brief comments on unreported data will be welcomed; it will, through a staff of Corresponding Editors, attempt to keep all members of the "Transplantation Registry" informed of forthcoming meetings of the professional societies, at which there will be presentations dealing with any aspects of transplantation. It will also try, through its Corresponding Editors, to have the subjects covered in a coordinated fashion at the meetings; it will maintain a bibliography in the fields listed in the first item above. The ***Transplantation Bulletin*** extends an invitation to all workers in the fields of medicine and biology interested in tissue transplantation, to submit their name and field of interest to E. J. Eichwald, M.D., University of Utah College of Medicine, Salt Lake City, Utah. A subscription fee of $3.00, to cover the expenses of printing the Bulletin and maintenance of the Registry and bibliography, will be payable after the first issue of the Bulletin has appeared.

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• **H. Burr Steinbach,** Professor of Zoology at the University of Minnesota, has been named Assistant Director for Biological and Medical Sciences of the National Science Foundation replacing Fernandus Payne who has served as Assistant Director for the past year.

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• Twenty-three **training courses in various aspects of environmental sanitation** will be conducted by the Environmental Health Center of the Public Health Service at Cincinnati, Ohio during the period July 1, 1953 to June 30, 1954. These short courses are given for professional personnel from State and local health departments, water pollution control agencies, the Public Health Service, other governmental units, educational institutions, and industries cooperating with these agencies in environmental sanitation programs. The schedule includes advanced training in chemical, bacteriological, biological and engineering aspects of stream and industrial waste surveys for water pollution control, and short courses dealing with special problems in water and industrial waste analyses, water supplies, sewage disposal, milk and food sanitation, radiological health, and occupational radiation protection. A bulletin describing the courses is available upon request from the Officer in Charge, Environmental Health Center, Public Health Service, Department of Health, Education, and Welfare, Cincinnati, Ohio.

• **The Fifth Congress of the International Society of Soil Science** will be held during the first two weeks of August, 1954, probably from August 7-15, at Leopoldville, Belgian Congo. The main purpose of the meeting will be the discussion of techniques for the evaluation of soil fertility in relation to the improvement of crop yields. The Congress will be followed by excursions in the Belgian Congo. All correspondence should be sent to: General Secretary's Office of the Fifth International Congress of Soil Science, 12, rue aux Laines, Brussels, Belgium.

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• **A center for holding and photoduplicating foreign scientific translations has been established by the National Science Foundation in the Science Division of the Library of Congress.** Partial support for the project has been contributed by the U.S. Atomic Energy Commission. Establishment of the translations center is part of a Foundation program to assist American scientists to keep informed on current scientific progress in other countries. Scientific translations will be collected from any sources. Initially, the center will put major emphasis upon translations from Russian scientific journals although it is hoped eventually to add material from other languages for more comprehensive coverage of the world's scientific literature. Monthly lists of translations newly received will be issued by the Library of Congress. The monthly listings will include notices of translations that are available by direct purchase from commercial and other translating services but the center will not supply photocopies of such material. The price list established by the center for copies of translations is as follows: photostats or enlarged microprints, 1 to 10 pages, $1.25, 11 to 15 pages, $1.75; microfilms, 1 to 50 pages, $1.00. Inquiries about the new service should be addressed to the Scientific Translations Center, Science Division, Library of Congress, Washington 25, D.C.

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• Information has been received in the AIBS office about the **André Dreyfus Foundation Prize,** an award in international genetics. Applications are invited under the following conditions: (1) the Prize for 1954 is worth 150.00 Cruzeiros; (2) it will be awarded to a work related to Genetics and is open to scientists from any country, working individually or as a team; (3) the Prize is intended primarily for the promotion of (a) scientific research in connection with genetics, (b) travel for purposes of study, (c) publication of research in connection with genetics; (4) applications should be accompanied by (a) the candidate's *curriculum vitae,* (b) a list of published works, if any, (c) a detailed plan of the research or travel proposed or three copies of the work for publication. Applications, accompanied by supporting documents, should be received by the Secretary General of the Foundation, Jenny Dreyfus, before November 30, 1953, at the following address: Rua Anchieta, 5, Apto. 1002, Leme, Rio de Janeiro, Brazil, South America.

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• A nationwide forum, **the Mid-Century Conference on Resources for the Future,** has been scheduled for December 2-4, 1953, in Washington, D. C. This Conference has been called by Resources for the Future, Inc., a nonprofit corporation for research and education in the field of natural resources. The agency has received a grant from the Ford Foundation to conduct the conference. The steering committee includes representatives of the industries that extract, trade in, and use raw materials, along with representatives of conservation organizations and groups interested in long-range problems bearing on resources. "Since the conservation movement was launched under Theodore Roosevelt a half century ago," Dr. R. G. Gustavson, President of Resources for the Future, states, "there have been many separate studies and meetings of industrial and conservation groups. Now it is proposed, for the first time on so large a scale, to bring them together in a single meeting to look at the resources problem as a whole and to endeavor, through study and discussion, to point the way to mutually satisfactory solutions." The conference will not endorse programs or seek to come forward with a program of its own. Rather, Dr. Gustavson added, "the great contribution of this mid-century meeting can be to lay the groundwork for the adoption by others, in both public and private undertakings, of policies and programs which will safeguard and promote the national interest now and for later generations."

Eight main sections are planned, in addition to general meetings; Section I—Competing Demands for Use of Land; Section II—Utilization of Land Resources; Section III—Water Resource Problems; Section IV—Problems of Nonfuel Minerals; Section V—Energy Resource Problems; Section VI—World Supply and Availability; Section VII—Problems in Resources Research; Section VIII—Patterns of Cooperation.

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• **The National Research Council of the National Academy of Sciences is now accepting applications for the following postdoctoral and predoctoral fellowships for the 1954-55 academic year.**

NRC Postdoctoral Fellowships in the Natural Sciences. Supported by the Rockefeller Foundation, these are intended to promote training in basic research, primarily in educational and research institutions of the United States and in exceptional cases in institutions abroad. These fellowships are open to citizens of the United States and Canada and are available in the fields of Agriculture, Anthropology, Astronomy, Biochemistry, Biophysics, Botany, Chemistry, Forestry, Geography, Geology, Geophysics, Mathematics, Paleontology, Physical Geography, Physics, Psychology and Zoology.

Lilly Research Laboratories Postdoctoral Fellowships in the Natural Sciences. These fellowships are available in those sciences fundamental to the understanding of biological phenomena, especially in the borderline fields between Chemistry, Biology and Physics. Open only to citizens of the United States, applicants must have the equivalent of a Ph.D. or Sc.D. degree and must have demonstrated superior ability for creative research.

Merck Senior Postdoctoral Fellowships in the Natural Sciences. Applicants for these fellowships must produce evidence of training in Physics, Chemistry, Biology or preclinical medical sciences equivalent to that represented by the Ph.D. degree, and must have had at least three years of postdoctoral professional experience in their major field, including not more than one year of fellowship work. These fellowships, with no age restriction, are open only to citizens of the United States.

For all above fellowships the applicant must chose an institution other than that at which he has had most of his academic training. Applications for any of these programs must be postmarked on or before December 10, 1953. Fellowships will be awarded in the late winter or early spring. Complete details and application blanks may be obtained from the Fellowship Office, National Research Council, 2101 Constitution Avenue, N. W., Washington 25, D. C.

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• **Beginning in 1954** North Carolina State College, the University of Florida, Virginia Polytechnic Institute and the Southern Regional Education Board will jointly sponsor cooperative **Graduate Summer Sessions in Statistics.** These sessions should be of particular interest to (1) research and professional workers who want intensive instruction in basic statistical concepts and modern statistical methodology; (2) teachers of elementary statistical courses who want formal training in modern statistics; (3) prospective candidates for graduate degrees in statistics; (4) graduate students in other fields; and (5) professional statisticians who wish to keep

informed of advanced specialized theory and methods. Each session will last six weeks and each course will carry three semester hours of graduate credit, with a maximum of six semester hour credits earned in one summer. During the 1954 session, which will be held at Virginia Polytechnic Institute, Prof. Maurice Kendall of the University of London will give a course in Multi-variate Analysis, and Dr. Ralph Comstock of North Carolina State College will offer one in Quantitative Genetics. The staff of the Virginia Polytechnic Institute's Department of Statistics will offer such courses as Probability and Inference, Analysis of Variance, Statistical Methods, Engineering Statistics, Education Statistics, Rank Order Statistics and the Theory of Sequential Methods. The fee for the VPI session in 1954 is $30.00. Board, room, post office box and laundry for the entire session may be had at $76.40. The session is scheduled for June 9 to July 17. Inquiries should be addressed to Boyd Harshbarger, Head, Department of Statistics, Virginia Polytechnic Institute, Blacksburg, Virginia.

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• **The Conservation Education Association was organized at Purdue University, September 18, 1953 as a national professional group to promote conservation education.** Dr. A. G. Peterson, president of the Eastern Montana College of Education, was elected President of the new society. Other officers are: Howard Michaud, Purdue University, Vice-president; Richard L. Weaver, University of Michigan, Secretary; and William Voight, Executive Director of the Izaak Walton League, Treasurer. The Board of Directors is composed of: R. H. Eckelberry, E. L. Palmer, Olin Capps, Arthur S. Rollins, E. C. Harrah, A. C. Dawson, and C. W. Mattison. The 2nd Annual Meeting and Workshop is scheduled for Laramie, Wyoming, the third week of August, 1954 with Teacher Training in Conservation as the major emphasis. Charter membership will be available until September 1, 1954. Active membership dues are $5.00 per year, organization membership will be $10.00 per year. Sustaining membership of $50.00 and contributing memberships of $100.00 will be available for groups desiring to assist financially in the new program.

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• **The 2nd International Congress for the Philosophy of Science** is planned for August 23-28, 1954 at Zurich, Switzerland. The Congress Committee proposes that the following two subjects be used as a basis for eventual communications: (a) confrontation of the different trends and points of view with the intention to understress opposite and common views; (b) value of the philosophy of science for research itself. Further information about the Congress may be obtained from the office of the Secretary, International Forum of Zurich, Swiss Federal Institute of Technology, Room 20d, Zurich 6, Switzerland.

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• **The Tenth Annual Conference on Protein Metabolism,** sponsored by the **Bureau of Biological Research of Rutgers University,** will be held in New Brunswick, N. J. on January 29-30, 1954. General subject of the Conference will be "Serological Approaches to Studies of Protein Structure and Metabolism." Reports will be given on proteins as antigens and antibodies, the precipitin reaction and studies of native and denatured proteins and derivatives, light scattering and ultracentrifugation methods in studies of precipitin systems and their application to human metabolism, immunological analysis of the biosynthesis of a protein, use and limitations of serum agar techniques, and measurement and significance of serological correspondence among proteins by Drs. Felix Haurowitz, Michael Heidelberger, David Gitlin, Melvin Cohn, J. Munoz, and Alan A. Boyden. The conference is open to all registrants. Reservation blanks may be secured from Prof. William H. Cole, Rutgers University, New Brunswick, New Jersey.

• **Two new members of the Scientific Manpower Commission** were elected recently. They were **Benjamin F. Hake** (Gulf Oil Corporation), nominated by the American Geological Institute, and **Wallace R. Brode** (National Bureau of Standards), nominated by the American Association for the Advancement of Science. Their election completes the roster of Commission members. The other members of the SMC are: Howard Meyerhoff (President), Henry A. Barton and George R. Harrison, representing the physicists; M. T. Carpenter and B. R. Stanerson, representing the chemists; E. G. Begle and S. S. Cairns, speaking for the mathematicians; John S. Nicholas and Frank P. Cullinan, representing general biologists, and Milton O. Lee and Joseph H. Roe, representing medical biologists; Leonard Carmichael and Dael Wolfle, representing the psychologists; and Detlev W. Bronk, serving on nomination by the American Association for the Advancement of Science. The Commission is engaged in a critical study of scientific manpower for the leading scientific organizations of the country. It recently completed a survey of vocational guidance pamphlets, available to students and teachers of science, and is currently analyzing the utilization of scientists in universities and colleges. The Commission offices are located at 1530 P Street, N. W., Washington 5, D. C.

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• **George A. Baitsell,** Executive Secretary of the Society of the Sigma Xi since 1940, resigned recently to devote his entire time to the editorial work of the Society. In the future Dr. Baitsell will be full-time editor of the *American Scientist,* the quarterly publication of the Society, and of *Science in Progress,* a biennial volume.

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• During the meeting of the 19th International Physiological Congress in Montreal, August 31 to September 5, 1953, official delegates from physiological societies of seventeen countries voted unanimously to form an **International Union of the Physiological Sciences.** A Council of eleven members was elected: E. D. Adrian (England), C. H. Best (Canada), K. M. Bykov (Russia), C. Heymans (Belgium), B. A. Houssay (Argentina), Y. Kuno (Japan), E. Lundsgaard (Denmark), A. Mayer (France), A. von Muralt (Switzerland), M. B. Visscher (U.S.A.), and H. H. Weber (Germany). The Council elected Prof. C. H. Best as President and Prof. M. B. Visscher as Secretary for three-year terms. The Council was instructed by the Assembly of the I.U.P.S. to complete arrangements for adherence to the International Council of Scientific Unions and to the Council for International Organizations in the Medical Sciences. The Council was also instructed to initiate actions looking toward improvements in the abstracting and indexing of literature in the physiological sciences on a world basis.

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• The Macmillan Company has signed a contract with George H. M. Lawrence, Director of the Bailey Hortorium, Cornell University, for **publication of the authorized biography of Liberty Hyde Bailey,** one of the world's greatest horticultural authorities, who celebrated his 95th birthday last March. Dr. Lawrence, long a co-worker with Dr. Bailey, succeeded the latter on his retirement in 1951 from the directorship of the Bailey Hortorium. Preparation for the biography was begun eight years ago with the making of stenographic transcriptions of informal discussions between Dr. Bailey and student groups and others. In 1951 Dr. Bailey and his daughter, Ethel Z. Bailey, turned over to Dr. Lawrence all personal papers and The Macmillan Company has made available to the biographer its records covering a 60-year period of publishing relations with Dr. Bailey. Dr. Lawrence would like to hear from anyone having letters written by Dr. Bailey during the years 1900-1903, and anyone having personal recollections of events shared with Dr. Bailey between 1900 and 1935.

• In 1952 the Congress passed the **Armed Forces Reserve Act,** which stipulates that ROTC graduates and Selective Service inductees shall constitute a military reserve upon completion of their regular tour of military training and service, and that the armed forces will have the first call upon them for a total period of eight years. Dr. Howard Meyerhoff, President of the Scientific Manpower Commission, recently issued a statement about the current status of a bill designed to establish a **National Manpower Board.** Since the Armed Forces Reserve Act was passed, sample surveys of industry and of selected but representative groups of scientists have revealed that approximately 25% of those constituting the reserve, and hence subject to recall, occupy key posts in essential industry. With these facts in mind, a bill was introduced into the House of Representatives (H. R. 3893) by Representative Johnson (California) on March 11, 1953 and into the Senate (S. 1551) by Senator Flanders (Vermont) on April 2, 1953. This bill proposed that there be established in the Office of the President a National Manpower Board that will advise the President on national problems relating to specialized personnel and that will serve as an appeals board to assure the most effective use of reservists who are recalled to military duty. The proposed National Manpower Board would be composed of nine persons appointed by the President, and not more than three of them would be members of the armed forces. The appointees "shall be persons who by training and experience are thoroughly familiar with the needs of the Armed Forces, defense production, and the national health, safety, and interest; and familiar with the functions of specialized personnel including the professions, such as engineering and the physical sciences, but not including the healing arts." The bill has taken the customary course of new legislation: it has been referred to the appropriate committees and subcommittees in the two houses of Congress and it has been referred to the Department of Defense for comment. The Congress has recessed without scheduling hearing on the proposed amendment, but efforts will be made to assure hearings either in the House or in the Senate when Congress reconvenes in January. The Scientific Manpower Commission, of which the AIBS is an active member, feels that this legislation is of such importance to the scientists and engineers of the country that they should be kept fully informed regarding the provisions of the bill, its progress through the Congress, its reception in the Department of Defense, and its prospects of passage. It is hoped that scientists will make their thoughts on the subject known to their representatives in Congress.

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• Some of the **forthcoming international and foreign scientific and technical meetings** which may be of interest to biologists are listed below:

November 7-10, 1953. *Symposium on Arid Zone Plant Ecology.* Advisory Committee on Arid Zone Research of UNESCO (by invitation). Montpellier, France.

November 16-28, 1953. *Eighth Pacific Science Congress* and Fourth Far Eastern Prehistory Congress, National Research Council of the Philippines. Quezon City, Philippines.

November 20-21, 1953. *Symposium on the Biochemical and Physiological Interrelationships of Glutathione,* National Science Foundation and Office of Naval Research. Ridgefield, Connecticut.

November 23—, 1953. *Food and Agriculture Organization of the United Nations,* Annual Conference, 7th Session. Rome, Italy.

May 29-June 5, 1954. *Eleventh International Ornithological Congress.* Basel, Switzerland.

July 2-14, 1954. *Eighth International Congress of Botany,* International Union of Biological Sciences. Paris, France.

July 6-9, 1954. *International Conference on Electron Microscopy.* Joint Commission on Electron Microscopy of International Council of Scientific Unions. London, England.

• Dr. Morris C. Leikind, Chief, Historical Research Division of the Armed Forces Institute of Pathology, Washington, D. C., will mail, for a limited time, copies of **"The Microscope Collection of the Medical Museum."** This eight-page reprint, originally published in an Abbott Laboratories publication for the medical profession, has magnificent colored photographs of early microscopes. Anyone interested in mounting these photographs for laboratory demonstration purposes will be sent two copies of the reprint, free of charge, while the supply lasts.

From the SOCIETIES

• **William Campbell Steere,** Department of Biological Sciences, Stanford University, has been named Editor-in-Chief of the *American Journal of Botany* to succeed Oswald Tippo, of the University of Illinois, who has recently become Dean of the Graduate College at that Institution.

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• **The American Society for Horticultural Science** celebrated its fiftieth anniversary at the Annual Meeting held at Madison, Wisconsin, September 7-9. On September 9, 1903, thirty men met at the headquarters of the Massachusetts Horticultural Society in Boston to approve the Constitution and By-Laws of the new Society. On September 9, 1953, over 400 attended the annual meeting. Membership in the Society now exceeds 1,715.

At the Madison meeting the evening lecture under the sponsorship of Sigma Xi and the American Institute of Biological Sciences was delivered by Dr. E. J. Kraus and was entitled "Significance of Growth Regulating Substances in Agricultural Practice." At the annual banquet celebrating the anniversary, two of the eight surviving charter members, A. T. Erwin and V. H. Davis, were recognized as the honored guests of the Society. The scientific program was comprised of 207 papers and included a symposium with the American Society of Plant Physiologists and the Physiological Section of the Botanical Society of America, on the subject "Photoperiodism."

At the annual banquet the following awards were announced for the most outstanding papers published during 1952 in the Proceedings of the Society (Volumes 59 and 60): *Alex Laurie Award in Floriculture and Ornamental Horticulture,* H. W. Siegleman, U. S. Dept. of Agriculture, Box 99, Wenatchee, Wash.; *Joseph H. Gourley Award in Pomology,* John Einset, New York State Agricultural Experiment Station, Geneva, N. Y.; *Charles G. Woodbury Award in Raw Products Research,* Amihud Kramer, University of Maryland, College Park, Maryland; *Leonard H. Vaughan Award in Vegetable Crops,* A. N. Reath and S. H. Wittwer, Michigan State College, East Lansing, Michigan.

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• The **twenty-second annual meeting of the Genetics Society of America** will be held under the auspices of the American Association for the Advancement of Science at Boston, Massachusetts, December 28-30, 1953.

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• The annual meeting of the **American Mosquito Control Association, Inc.,** will be held in Atlantic City, New Jersey, March 8-12, 1954.

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• **To persons planning to attend the VIII International Botanical Congress** to be held in Paris, July 2-14, 1954, the Bankers and Merchants Travel Service, 511 Fifth Avenue, New York 17, N.Y., wishes to offer its services in arranging transportation accommodations.

• **The Travel Committee of the Genetics Society of America** succeeded in raising a sum of money to assist members to attend the IXth International Congress of Genetics held in Bellagio, Italy, August 24-31, 1953. The organizations that so generously contributed to this fund are: National Science Foundation; American Cancer Society; Damon Runyon Memorial Fund for Cancer Research; Rapkine French Scientist Fund; Kimber Farms, Niles, California; Nicholas Poultry Farm, Kingston, New Hampshire; Carworth Farms, New City, New York; DeKalb Agricultural Association, Illinois; Ferry Morse Seed Company, Detroit; Associated Seed Growers, New Haven; Dover Publications, New York; W. H. Freeman and Company, Publishers, San Francisco; New American Library of World Literature, New York; and Eli Lilly and Company, Pharmaceuticals, Indianapolis.

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• At the end of 1953, **Professor Horace W. Stunkard,** New York University, will complete his second 5-year term as Chairman of the Editorial Committee and Managing Editor of the *Journal of Parasitology*. At that time he will retire from this office and will be succeeded by **Dr. George R. LaRue.** After January 1, 1954, therefore, all correspondence with the Editorial Office and all manuscrips submitted for publication in the *Journal of Parasitology* should be addressed to Dr. George R. LaRue, Bureau of Animal Industry, U. S. Department of Agriculture, Beltsville, Maryland.

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• The eleventh annual meeting of the **Electron Microscope Society of America** will be held at the Pocono Manor Inn, Pocono Manor, Pennsylvania, November 5-7, 1953. Programs with abstracts of papers will be available after October 15 from A. R. T. Denues, Program Chairman, Sloan-Kettering Institute for Cancer Research, 444 East 68th Street, New York 21, N.Y. Local arrangements are being handled by Kenneth S. McCarty, Veterans Administration Hospital, 130 West Kingsbridge Road, Bronx, New York.

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• **The Ecological Society of America** has available the following reprints of *Ecological Life History Outlines:*

Ecological life history outlines for fungi by W. B. Cooke.

An outline for ecological life histories of herbaceous hydrophytes by W. T. Penfound.

Outline for ecological life history studies of herbaceous plants by O. A. Stevens and L. F. Rock.

Outline for ecological life history studies of vascular epiphytic plants by J. T. Curtis.

Outline for ecological life histories of solitary and semi-social bees by E. G. Linsley, J. W. MacSwain and Ray F. Smith.

For each copy desired send ten cents to: Murray F. Buell, Secretary of the Ecological Society of America, Rutgers University, New Brunswick, New Jersey.

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• **The Fiftieth Annual meeting of the American Society of Zoologists** will be held December 28-30, 1953 at Boston, Mass., with the annual meeting of the American Association for the Advancement of Science. The Presidential Symposium on "Bioluminescence as a Tool in the Study of Cell Processes" will have E. Newton Harvey as Chairman and W. D. McElroy, F. H. Johnson, A. M. Chase and John Buck as speakers. A panel discussion on "Teaching of the Physiological Sciences at the Undergraduate Level" is being arranged. Dr. Paul Weiss, Vice-President of Section F of the AAAS, will deliver the annual dinner address Tuesday, December 29 on "Beauty and the Beast: Life and the Rule of Order."

The A·I·B·Scope

• Heretofore the Annual Meetings of AIBS have been arranged, with increasing success, by Dr. C. J. Hylander. Owing to changing circumstances, it is necessary for him to give up his responsibilities as Convention Director. **Dr. Hiden T. Cox, Deputy Executive Director of AIBS, is now serving as Convention Director for the 1954 meetings** in Gainesville, Florida. All correspondence relating to these meetings should be addressed to Dr. Cox at the AIBS, 2101 Constitution Ave., Washington 25, D. C. Dr. Hylander is giving Dr. Cox the benefit of his valuable experience in the arrangement of large campus meetings. It is therefore expected that the meetings at the University of Florida, September 5-9, 1954, will maintain the high standards set by Dr. Hylander.

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• **The AIBS Advisory Committee in Hydrobiology to the Office of Naval Research** met in Madison, Wisconsin on September 7, 1953. Dr. Robert Hiatt of the University of Hawaii Marine Biological Laboratory and chairman of the Committee reported on the status of the Hydrobiology Directory. This Directory, to be published early in 1954 by the University of Hawaii Press, will reach about 300 pages and be illustrated with maps and photographs. Approximately 1300 persons will be included in the roster of North American hydrobiologists and almost 150 laboratories will be listed with information as to facilities and personnel for research and for teaching at each.

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• **Arnold Grobman,** Department of Biology, University of Florida, has been named the representative of the American Society of Ichthyologists and Herpetologists on the Governing Board of the AIBS.

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• The American Phytopathological Society recently elected **James G. Dickson,** University of Wisconsin, to serve as its representative on the Governing Board of the AIBS.

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• **William R. Duryee,** of the Carnegie Institution, Washington, D. C., has been elected to represent the Society of General Physiologists on the Governing Board of the AIBS.

The BIOLOGY LIBRARY

One copy of each publication submitted for listing should be sent to the Editor, The AIBS Bulletin, 2101 Constitution Avenue, Washington, D. C. Only books published within a year of receipt will be reviewed. Older books will be listed.

Advances in Genetics. Volume V. Edited by M. Demerec. 331 pages, including tables and figures. Academic Press Inc., 125 East 23rd Street, New York 10, N.Y. (1953) $8.50.

The following articles are included in this latest addition to the valuable series on advances in genetics: "Population Dynamics of Rodents and Other Small Mammals" by W. Frank Blair; "The Genetics of Polymorphism in the Lepidop-

tera" by E. B. Ford; "Inheritance in Bacteriophage" by A. D. Hershey; "Biochemical Genetics of *Bombyx mori* (Silkworm) by Hideo Kikkawa; "The Genetics of *Aspergillus nidulans*" by G. Pontecorvo; "Genetics of the Silkworm, *Bombyx mori*" by Yoshimaro Tanaka.

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Algal Culture from Laboratory to Pilot Plant. Edited by JOHN S. BURLEW. 357 pages, 92 figures. Carnegie Institution of Washington, 1530 P Street, N.W., Washington 5, D.C. (1953) $1.25.

This is an extremely interesting and valuable publication on the culture of algae. It brings together a fairly complete record of the work to date prepared by experts in the field. In the foreword, Dr. Vannevar Bush states: "It is hoped that, as a progress report of a rapidly developing field of science and engineering, this book will serve to stimulate even more interest in the subject, and will result in increased progress toward the large-scale culture of algae." The bibliography includes selected references on the mass culture of *Chlorella* and immediately related subjects as well as additional references cited in the text.

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The Analysis of Fermentation Acids. JAMES B. MCNAIR. 290 pages, including diagrams, tables, and bibliography. James B. McNair, 818 South Ardmore Avenue, Los Angeles 5, California. (1947) $7.50.

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Anatomy and Physiology Laboratory Manual. ARTHUR W. GLASS and CHARLES HAMRUM. 57 pages, 84 figures. W. B. Saunders Company, West Washington Square, Philadelphia 5, Pa. (1953) $1.50.

This is a compilation of laboratory exercises designed for use in a one-semester course in human anatomy and physiology. The exercises are entitled: Microscope; The Cell; Mitosis; Study of the Tissues; Study of the Blood; Study of the Skeleton; Study of Selected Muscles; Experiments in General Physiology; Experiments in Muscle Physiology; The Foetal Pig. An appendix contains useful formulae. Blank pages for notes are provided.

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Animal Biochromes and Structural Colours. DENIS L. FOX. 379 pages, 3 colored plates, 37 figures, 11 tables. Cambridge University Press, 32 East 57th Street, New York 22, N. Y. (1953) $11.00.

In recent years investigations concerning the color and pigments of animals have added materially to both our knowledge and appreciation of this complex field of biology. The author, in his preface, writes "My attempt has been to gather together facts and possible correlations regarding colors and colored compounds of animals to serve the interests of students and investigators in various fields of biology, physicists and chemists with biological leanings, and especially those whose work in the field of biochemistry might derive benefit from a summary treatment of certain animal pigments of established or potential physiological bearing." Early chapters of his survey deal with the physical aspects of color in living beings, and later ones with the chemical basis. Dr. Fox is Professor of Marine Biochemistry at the Scripps Institutions of Oceanography of the University of California.

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Bibliography on the Genetics of Drosophila. Part Two. IRWIN H. HERSKOWITZ. 212 pages. Commonwealth Agricultural Bureaux, Farnham Royal, Slough, Bucks., England. (1952) $3.00.

The 2841 titles included in this bibliography cover the years 1939 through 1950, supplementing those in Professor H. J. Muller's "Bibliography on the Genetics of *Drosophila*," published in 1939. Some titles which appeared before 1939, not found in the earlier bibliography, are included. To increase the usefulness of the bibliography, primarily for students and investigators not already familiar with the wealth of information on *Drosophila*, a title index is included covering the present as well as Muller's earlier collection of titles.

Biochemistry and Physiology of Nutrition. Volume I. Edited by GEOFFREY H. BOURNE and GEORGE W. KIDDER. 569 pages. Academic Press Inc., 125 East 23rd Street, New York 10, N. Y. (1953) $13.00.

As the beginning of the science of nutrition dates from about the middle of the nineteenth century, the present work represents the results of one hundred years of development of the subject. This book was written by specialists and directed to all workers dealing with problems of metabolism as well as to the nutritionists. The book is divided into the following sections: The Early Development of the Science of Nutrition; The History of Vitamins; Water and Electrolyte Metabolism; Carbohydrate Metabolism; Amino Acids; the Biosynthesis of Proteins; Lipid Metabolism; The Fat-Soluble Vitamins; The Vitamin B Complex; Vitamins and Hematopoiesis; and Vitamin C. Contributors to Volume I include: H. Borsook, E. P. Cathcart, C. L. Deasy, A. C. Frazer, L. J. Harris, T. H. Jukes, S. K. Kon, B. B. Lloyd, Alton Meister, T. Moore, J. W. G. Porter, T. L. Sourkes, and R. L. Zwemer.

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Chemical Physiology of Contraction in Body and Heart Muscle. A. SZENT-GYORGYI. 135 pages, illustrations. Academic Press, Inc., 125 East 23rd Street, New York 10, N.Y. (1953) $4.80.

For fourteen years A. Szent-Gyorgyi, who is now Director of the Institute for Muscle Research at the Marine Biological Laboratory, Woods Hole, Mass., has been studying muscle. In 1947 he reported the discovery of actinomyosin and the isolation of its components, actin and actin-free myosin, and showed muscular contraction to be a reaction of this protein complex with ATP and ions. Since then Dr. Szent-Gyorgyi and his students have been steadily adding to the rapidly accumulating literature of the mechanism of muscle action. This small book is not offered as a comprehensive or objective review; it does describe steps from actinomyosin to cellular entity and "ties together" the threads of the entire story.

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Elements of Chordate Anatomy. CHARLES K. WEICHERT. 451 pages, illustrated. McGraw-Hill Book Company, Inc., 330 West 42nd Street, New York 36, N.Y. (1953) $5.50.

The present volume is a condensation of *Anatomy of Chordates* by the same author and is designed primarily as a text in one-semester courses. An introduction to chordate anatomy is followed by a survey of the phylum Chordata. A chapter on the development of the individual completes the background material. A comparative study of the organ systems of vertebrates is then presented. The contents are well organized with a summary following each chapter. The excellent illustrations are directly labeled.

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Essentials of Physiological Chemistry. ARTHUR K. ANDERSON. 480 pages, 42 figures. John Wiley & Sons, Inc., 440 Fourth Avenue, New York 16, N.Y. (4th edition, 1953) $5.00.

This book presents the important facts of biochemistry, as related to the animal body, for students with limited preparation in both chemistry and biology. The author is Professor of Physiological Chemistry at The Pennsylvania State College and has a background of thirty-two years experience in teaching and research in the field of biochemistry. Since the publication of the 3rd edition of this book in 1947, many advances have been made in biochemistry and the present volume brings the information up to date.

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Evolution: Symposia of the Society for Experimental Biology. Number VII. Edited by J. F. DANIELLI and R. BROWN. 448 pages. Academic Press Inc., 125 East 23rd Street, New York 10, New York. (1953) $7.80.

This volume contains the papers read at a Symposium of the Society for Experimental Biology, held in collaboration with the Genetical Society at Oxford, England in July 1952. Edited by J. F. Danielli and R. Brown and with a foreword by J. B. S. Haldane, the book contains sections contributed by J. W. S. Pringle, E. Baldwin, C. N. Hinshelwood, M. Demerec, D. G. Kendall, K. Mather, J. M. Thoday, H. G. Baker, D. H. Valentine, R. E. Holttum, I. Manton, C. H. Waddington, H. Spurway, W. Hovanitz, W. H. Dowdeswell, E. B. Ford, P. M. Sheppard, M. J. Heuts, D. M. Steven, P. B. Medawar, S. M. Manton, E. N. Willmer, M. R. A. Chance and A. P. Mead. Speaking of "the current instar of the evolution theory," Haldane writes in his foreword, "We are certainly not ready for a new moult, but signs of new organs are perhaps visible. The papers here collected represent points of view too diverse to be capable of coadaptation at present . . . they point forward to a broader synthesis in the future."

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Fertilizer Technology and Resources in the United States. Edited by K. D. JACOB. 454 pages, illustrated. Academic Press Inc., 125 East 23rd Street, New York 10, N.Y. (1953) $8.50.

This is Volume III of *Agronomy*, a series of monographs prepared under the auspices of The American Society of Agronomy. It brings together in concise form authoritative information on the resources, chemistry, technology, and manufacture of fertilizers and fertilizer materials with the major emphasis on resources and practices in the United States. The volume provides a ready reference for teachers, students, technologists, fertilizer manufacturers, and others seeking information on the subjects discussed.

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Fishery Science: Its Methods and Applications. GEORGE A. ROUNSEFELL and W. HARRY EVERHART. 444 pages, illustrated. John Wiley & Sons, Inc., 440 Fourth Avenue, New York 16, N.Y. (1953) $7.50.

In the foreword to this practical approach to fishery science, Clarence Cottam, Assistant Director, Fish and Wildlife Service, writes: "This splendid pioneering book is not a mere compilation and reference text, but a very readable and realistic summary of the better methods and procedures for solving the problems affecting marine and freshwater fisheries." The authors state that "The real purpose is to present the problems that confront the administrator, the research worker, and the student, and to show how to go about solving them." The book can be used either as a general text or as a reference work. It includes a valuable glossary, a list of fishery organizations and journals, and carefully selected references.

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Fundamentals of Microbiology. MARTIN FROBISHER, JR. 633 pages, 253 figures. W. B. Saunders Company, West Washington Square, Philadelphia, Pa. (Fifth edition, 1953). $6.00.

This fifth edition of a standard microbiology text has been completely revised, rearranged and considerable portions rewritten. The author has thereby eliminated obsolete material and introduced the latest advances in the field. Dr. Frobisher is Professor and Head of the Department of Bacteriology, University of Georgia; Associate Professor of Bacteriology, Emory University; Visiting Lecturer, Johns Hopkins University and Special Consultant, U. S. Public Health Service.

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A Guide to Bird Finding West of the Mississippi. OLIN SEWALL PETTINGILL, JR. 709 pages. Oxford University Press, 114 Fifth Avenue, New York 11, New York. (1953) $6.00.

This volume is the counterpart of the author's *A Guide to Bird Finding East of the Mississippi* (1951) and is identical with it in organization and style. Twenty-two states are covered and the places for bird finding are chosen with the over-all purpose of showing (1) species of birds; (2) important bird concentrations such as breeding colonies and wintering aggregations; (3) representative types of bird habitats, from ocean beaches and deserts to mountaintops; and (4) the widest possible diversity of birds existing in the vicinity of all the large metropolitan areas and leading vacation centers. Included among the places are the major National Parks and National Wildlife Refuges, a large number of National Monuments, many state and municipal parks and refuges, and numerous private sanctuaries and estates. In addition to bird-finding places, brief mention is made of institutions—museums, colleges, universities, research stations, summer camps, libraries, zoos—that are of ornithological interest. State and local ornithological societies are also mentioned. The text material is illustrated with attractive pen and ink drawings by George Miksch Sutton.

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Handbook of Plants of the Colorado Front Range. WILLIAM A. WEBER. 232 pages, 78 figures. University of Colorado Press, Boulder, Colorado. (1953) $5.00.

The term "Front Range" applies to the first rugged chain of mountains the traveller sees when he approaches Denver from the East. The area covered extends from the western margin of the Great Plains to the Continental Divide and includes a range of altitude from 5,000 to over 14,000 feet. The author's introduction describes the plant zones in the Front Range and gives helpful suggestions for the collection and study of the flora. The text contains keys for the identification of the approximately 1,300 species of ferns, fern allies, conifers, and flowering plants of the region. The author is an experienced student of the Rocky Mountain flora and has prepared a book which will be of value to both the amateur and the professional.

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Heredity in Health and Mental Disorder. FRANZ JOSEF KALLMANN. 315 pages, 89 figures and 20 tables. W. W. Norton & Company, Inc., New York, N.Y. (1953) $6.00.

Franz J. Kallmann is Principal Research Scientist at the New York State Psychiatric Institute and Assistant Professor of Psychiatry at the College of Physicians and Surgeons of Columbia University. The material included in this book was presented by Dr. Kallmann as one of the Thomas William Salmon Memorial Lectures of the New York Academy of Medicine. His present research involves observations of thousands of pairs of twins and their families in an attempt to throw light on many of the unsolved problems of mental disorders. The current status of these studies is presented in this text. Principal topics considered are: Heredity in Relation to Mental Health, Heredity in Relation to Mental Disorder, and Contributions of Genetics to Mental Health Planning. In the foreword, Dr. Nolan D. C. Lewis points out that: "In this book one finds a progressive, constructive attitude toward all phases of the problem, supported by an amount of data that is most impressive in nature and scope."

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How Animals Move. JAMES GRAY. 114 pages, 52 figures and 15 plates. Cambridge University Press, American Branch. 32 East 57th Street, New York 22, N.Y. (1953) $3.00.

The author is a Fellow of King's College and a Professor of Zoology in Cambridge University. The content of this book was delivered to a juvenile audience at the Royal Institution in 1951. A general discussion on the machinery of animal movement is followed by a detailed description of different kinds of locomotion: swimming, walking, running, jumping, creeping, and flying. The steps involved in these various types of movement are clearly diagrammed and effectively illustrated.

The purpose of the author was to tell "how some of our commoner animals move and how they obey the same fundamental laws as those which govern the movements of inanimate things." Having achieved that objective, he suggests that, "The more we learn about living things, the more beautiful their activities appear; and in a human world so much concerned with ugly engines of destruction, the concept of natural beauty provides welcome relief."

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The Major Metabolic Fuels. Edited by ROBERT STEELE, J. R. KLEIN, and MARTIN GIBBS. 234 pages. Office of Technical Services, Department of Commerce, Washington 25, D.C. (1953) $1.35.

This publication records a Symposium held September 3-5, 1952, by the Biology Department, Brookhaven National Laboratory, Associated Universities, Inc., and is the fifth of a series to be known as the Brookhaven Symposia in Biology. The papers included are arranged under the following headings: Introductory Address, The Rate of Glucose Utilization, Hormonal Controls, New Metabolic Pathways, and Fatty Acids and Ketone Bodies. Discussions, following the presentation of papers, are included.

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The Natural History of Infectious Disease. SIR MACFARLANE BURNET. 356 pages. Cambridge University Press, American Branch, 32 East 57th Street, New York 22, N.Y. (2nd edition, 1953) $4.50.

Sir Macfarlane Burnet is the Director of the Walter and Eliza Hall Institute for Medical Research in Melbourne, Australia. The first edition of this book (then called *Biological Aspects of Infectious Disease*) appeared in 1940. The text of the second edition has been thoroughly revised. Consideration has been given to the important changes that have taken place in the approach to the problems of infectious disease since the first edition. The book will be of value to medical doctors, public health administrators, biologists, biochemists, parasitologists, and plant and animal pathologists as well as to the interested laymen.

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Nucleo-Cytoplasmic Relations in Micro-Organisms. BORIS EPHRUSSI. 127 pages, illustrated. Oxford University Press, 114 Fifth Avenue, New York 11, N. Y. (1953) $3.75.

Dr. Ephrussi, Professor of Genetics at the University of Paris, delivered the contents of this book as the William Withering Memorial Lectures of 1952 at the Birmingham Medical School. Although the Mendelian analysis of higher organisms has shown amazing progress, the author believes that the average biologist, focusing his attention on the cell nucleus, has reached an impasse with respect to an understanding of development. The general occurrence and significance of nuclear (Mendelian) heredity is not denied, but Dr. Ephrussi prefers to emphasize cytoplasmic heredity and search for the missing link between development and heredity. The main body of the book is a concise description of the results of recent studies of several microorganisms which reveal unsuspected genetic properties of the cytoplasm and nucleocytoplasmic relations. The problems of differentiation, cell heredity, and autoreproduction are discussed in this new perspective.

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Plant Morphology. ARTHUR W. HAUPT. 464 pages, 338 figures. McGraw-Hill Book Company, Inc., 330 West 42nd Street, New York 36, N.Y. (1953) $8.00.

There has long been a need for a single volume which presents a comprehensive survey of the plant kingdom with emphasis on evolutionary relationships. Professor Haupt has prepared such a volume. It presents a survey of the plant kingdom with representatives of the various groups arranged in ascending sequence from simple to complex. There is no implication of direct phylogenetic relationships in successive groups even though in some cases such relationships exist, but rather an emphasis on advancing stages of progress from what is assumed to have been the more primitive condition. Recent advances in morphology are included, many of the illustrations are new, a list of supplementary readings and a glossary are useful additions. Based upon twenty years of teaching experience by the author, this text will be of value to both student and teacher.

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Plant Physiology. BERNARD S. MEYER and DONALD B. ANDERSON. 784 pages, 183 figures and 49 tables. D. Van Nostrand Company, Inc., 250 Fourth Avenue, New York 3, New York. (1952) $8.50.

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Principles of Microbiology. WALTER W. KRUEGER. 648 pages, 143 figures. W. B. Saunders Company, West Washington Square, Philadelphia 5, Pa. (1953) $5.50.

This book is intended primarily as a text for an introductory course in general microbiology or bacteriology for college students. The author presents the basic principles, concepts and viewpoints of the subject in a volume of moderate size. The contents are divided into nine parts: Introduction; The Microscopic World; The Physiology of Microorganisms; Microbiologic Techniques and Methods; Useful Activities of Microorganisms; Microbiology of Sewage and Water; Microbiology of Foods; Infection and Body Defenses; and Infectious Diseases. Each chapter concludes with a list of review questions and a brief list of selected references. The illustrative material is closely correlated with the text.

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Social Behaviour in Animals. N. TINBERGEN. 150 pages, 67 figures, 8 plates. John Wiley and Sons, Inc., 440 Fourth Avenue, New York 16, N.Y. (1953) $2.50.

The author is Lecturer in animal behaviour at Oxford University. Concerning this book, he states: "This book is not intended as an exhaustive review of facts. Its aim is rather the presentation of a new, truly biological approach to the phenomena of social behaviour." It is the approach which makes this book essentially different from other books on social behaviour. Following an introduction, there are chapters on mating behaviour, family and group life, fighting, analysis of social co-operation, relations between different species, the growth of social organizations, evolutionary aspects of social organization, and some hints for research in animal sociology. The text can be followed by interested non-professionals as well as professionals in the field. The bibliography contains 119 citations.

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Some Conjugated Proteins: A Symposium. Edited by WILLIAM H. COLE. 73 pages. Rutgers University Press, New Brunswick, New Jersey. (1953) $1.75.

This small, paper-bound volume contains six lectures, presented at the Ninth Annual Conference on Protein Metabolism, held by the Bureau of Biological Research, Rutgers University, in January, 1953. Subject headings are: The Anatomy of Hemoglobin and Some Functions of Its Parts; Cytochromes in the Mammal; On the Problem of Nucleoproteins; The Metabolism of Virus-Infected Bacteria; Lipoproteins; Mucoproteins and Mucoids.

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Statistical Methods in Experimentation: An Introduction. OLIVER L. LACEY. 249 pages, including tables and figures. The Macmillan Company, 60 Fifth Avenue, New York 11, N.Y. (1953) $4.50.

To the student, the author states: "The whole point of this book is to introduce you to the idea of how to answer questions by way of an experiment." To the instructor, he points

out: "This text is designed for use in a one-semester course in general statistics as applied to experimentation" and "The essential aim of the text is to present elementary statistical techniques so that they will make sense and will be used with understanding rather than in cookbook fashion." The author also suggests a plan of procedure for use of the book which will undoubtedly be helpful. This well written volume provides the student with the necessary tools to read and understand a high percentage of the experimental articles in his field and to design and execute experiments of his own.

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Symposium on Some Aspects of Microbial Metabolism. Reprinted from the *Journal of Cellular and Comparative Physiology*, Volume 41, Supplement 1, March 1953. Published by the Wistar Institute of Anatomy and Biology, Philadelphia, Pa.

The fifth annual Biology Research Conference sponsored by the Biology Division of the Oak Ridge National Laboratory in cooperation with the Division of Biology and Medicine of the Atomic Energy Commission was held at Oak Ridge, Tennessee, on April 10-11, 1952. The papers presented at that conference are included here. As in previous conferences, free and open discussions were encouraged and they are reproduced in part. The topic "Some Aspects of Microbial Metabolism" was selected as the subject for the conference because of its importance in an understanding of the synthesizing mechanisms of living cells and its possible implications in the study of the mechanisms underlying radiation effects. This monograph is available, free of charge as long as the supply lasts, to scientific investigators in the field of microbial metabolism.

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Ways of Mammals, in Fact and Fancy. CLIFFORD B. MOORE. 273 pages. The Ronald Press Company, 15 East 26th Street, New York 10, N. Y. (1953). $3.50.

In the author's own words, "This book brings together the most interesting and persistent myths, superstitions, and misconceptions about mammals, together with comments on the origin and development of this body of folklore." Clifford Moore has been Director of the Forest Park Museum in Springfield, Massachusetts, since 1941, and has based his material on extensive research. Several sections are included by authorities on particular aspects of animal behavior. In this volume professional biologists will find answers to recurring questions, and the general reader will be intrigued by the actual facts about animal behavior as well as the folklore that has developed around it.

LETTERS
TO THE EDITOR

May, 1953

It was interesting to note the announcement in a recent copy of *Science* (number 3043, page 447) of the approval by the National Science Foundation of a series of grants. Fields included were: "astronomy, chemistry, developmental biology, earth sciences, engineering, genetic biology, mathematics, molecular biology, physics, psychobiology, regulatory biology, research education in the sciences, scientific information, studies in science, and systematic biology." This is just a rather extreme example of the tendency to fragment the field of biology, while considering as units other fields which are no more homogeneous.

It is my opinion that whenever possible we should present *biology* and *biologists* to the reading public, breaking lists down into specialties only when necessary. This is in line with the general purpose of the AIBS, I believe, in presenting a united front of the biological societies.

RICHARD B. WALKER,
Department of Botany, University of Washington, Seattle, Washington.

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September, 1953

How in the name of Heaven can biologists expect to recruit brilliant young students to become professional biologists when so many biologists "pooh pooh" Dr. Creighton's idea? (*AIBS Bulletin*, April, 1952). If professional biologists do not have an understanding of and faith concerning the tremendously important role of biology in the progress of mankind, then certainly the too often confused laymen cannot be expected to champion either biology or the biologist.

The value of a well-planned policy of recruitment for replacements and orderly expansion of biology should be evident. This would seem to be one aspect of the problem which Dr. Creighton called to our attention.

Based on data in *Science* 116 (3013): 311, 1952, the ability of those becoming professional biologists is not greatly different from that of the professionals in the physical sciences. It is possible that part of this deviation is the result of differences in training due to specialization.

In rebuttal to Professor Black (*AIBS Bulletin*, October, 1952), the following seems pertinent: Among mankind's most basic requirements are food and fiber. The three keystones involved are soil, plant and animal. As the population increases, greater demands arise. Who will be in the midst of the struggle to lead the way to greater production? The answer is "The biologists through research."

Professor Black's statement that we are suffering from an overproduction of biologists cannot be accepted, except in a very restricted sense. Based on the present amount of monies being allocated to biology, one might consider that there is an ample supply of biologists. But, we *cannot* say there are too many of them, when there are literally thousands of things in the field of biology to which we must answer "we do not know," especially so in photosynthesis, plant and animal nutrition, cell physiology, morphogenesis, physiology and biochemistry of the healthy and diseased organism, and many, many others.

If it is true that the future of many fields of biology is so dim that a person in his right mind should not encourage a bright youngster to enter these, as indicated by Professor Black, the whole profession of biology must share in this indictment. There is no question that the vast portion of biology has no one really showing the layman how much of his high living standard is attributable to the research results obtained by biologists. This in turn reflects the meager funds made available for research in biology at many of the institutions of higher learning and the equally meager results appearing from these institutions.

If we state the problems and show how the solution of these problems will benefit mankind, additional funds will be made available for research toward their ultimate solution. Let's get busy and inform the public.

FREEMAN W. SNYDER,
Department of Farm Crops, Michigan State College, East Lansing, Michigan.

From THE EDITOR . . .

LETTERS *to* the editor are a feature of most periodicals that try to please their readers. Such letters encourage the editor to believe that his magazine is being read, and give him some guidance in reader interests. Most important, perhaps, letters to the editor identify the writers with the magazine or the organization that it represents and with each other, thus tending to develop a corps of members or subscribers who are consciously and actively interested in the progress of the magazine and what it stands for.

Letters *from* the editor are equally important, not only in building good will with those who write to him, but in linking the editor with his readers as a whole. Letters from the editor to all who receive his magazine are usually called editorials, but are essentially an attempt to communicate—to establish a sympathetic rapport between editor and reader, and to promote the purposes of the magazine.

The *AIBS Bulletin*, now in its third volume, has published much material of an editorial nature from various contributors, and will publish, we hope, much more, in keeping with its subtitle " . . . views in the Biological Sciences." However, the previous editors of the *Bulletin*, Clarence J. Hylander and Samuel L. Meyer, did not establish an editorial column of their own, but preferred to apply their influence to the procurement and publication of the views of others. At its meeting in Madison, Wisconsin, on September 7, 1953, the Editorial Board of the *Bulletin* authorized your new editor to speak for himself in each issue. This letter, or editorial—whichever you choose to call it—is his first communication to you.

We wish first to discuss the *Bulletin*, because we believe it be the most vital organ of the body of our multicellular AIBS.

That the AIBS is alive today, and promises to survive and grow stronger, is due in large part to Dr. Hylander's initiative in founding the *Bulletin* and to the devotion of all concerned thereafter in developing it. Distributed periodically throughout the country, the *Bulletin* is the visible, tangible evidence of a functioning Institute, reminding the recipient and his associates that continuous effort is being exerted to improve the status of the life sciences. Reaction to the *Bulletin* may range from momentary recognition of its presence in the mail to thoughtful appreciation of its contents by those who can take time to read it and comment on it. But all who receive or see the *Bulletin* are made aware of the AIBS, such being the power of visual advertising.

In our busy lives there is more to be read and less time for reading than ever before. Competition for reader attention is severe, and every writer, editor, advertiser and publisher is striving to get the maximum reader-hours for his output. The *Bulletin* is a small part of the great competitive picture; it will be read widely by its own limited clientele only if it contains information so definitely connected with the work and welfare of the recipients that they cannot afford to neglect it. Obviously the success of the AIBS will bear some direct relation to the number of reader-hours devoted to the *Bulletin*. Therefore, the task of the editor is to determine what his potential readers would be willing or eager to read, or to keep for reference, and to procure and publish this information for them.

Assuming that the editor can determine what is wanted through suggestions made by the Editorial Board or by interested readers, the Board has directed him to formulate a general plan of publication involving solicited contributions on subjects of general interest to biologists, excluding conventional reports of biological research. In his outline "On Editorial Policy" (*AIBS Bulletin*, October, 1952, p. 18) H. Burr Steinbach, previous chairman of the Editorial Board, stated also that "biologists should not hesitate to send in unsolicited manuscripts to the Editor for consideration . . . " We wish to emphasize this invitation to all writers to submit what they believe to be appropriate and significant. Among such manuscripts will be masterpieces that we shall be privileged to publish in the *Bulletin*. We intend to use a judicious blend of solicited and unsolicited articles—to call upon recognized biological authorities for their wisdom on common problems and for information on their general field of work, and to accept from anyone, known or unknown, articles of inherent quality and sigificance. With the understanding that we are not obligated to the giver to accept his copy for publication or to act upon his suggestions, we shall greatly appreciate receiving any of the following:

1. Letters to the editor, including views on the general editorial policy of the *Bulletin*.
2. Suggestions on subjects of general interest, on which one or more solicited articles could be written.
3. Suggestions on writers who ought to be invited to contribute to the *Bulletin*.
4. Offers to write articles for the *Bulletin*.
5. Manuscripts to be considered for publication.
6. News items of interest to biologists.
7. Suggestions for the procurement of advertising.

Advertising revenue is extremely important to the existence of magazines like the *Bulletin*, that receive only part of the cost of production from the readers. Experienced editors of scientific journals have advised us to try to build up our advertising on a business basis, not by appeals to philanthropy or to the intangibles of good will. The advertiser's judgment can be swayed by specific information on the action of buyers; e.g., Professor X chose Alpha's book and Beta's microscope for his classes because they were advertised in the *Bulletin* and would not consider Gamma's book and Delta's equipment because they were not so advertised. A note to an advertiser or a word to his representative by a reader of the *Bulletin* on the presence or absence of certain advertising and its effect on a given sale may be of greater benefit to the *Bulletin* in the long run than an appeal to a company to advertise in the *Bulletin* "to support biology." If the *Bulletin's* readers will consistently support the companies that are Associate Members of AIBS, that exhibit their products at AIBS meetings, and that advertise in the *Bulletin*, those companies will help to support the *Bulletin* and other activities of AIBS.

The AIBS also needs to increase its own "advertising." Many scientists, including biologists, do not yet know enough about the AIBS. During the past year my predecessor, Dr. Samuel L. Meyer, spread the word in speech and writing at every opportunity, and we will try to do the same. But this missionary work need not be restricted to the officers and staff of AIBS; it is also for AIBS members, in the sense of individual members of member societies, to tell non-member friends and associates about AIBS and what it does and should do for biology in the United States. We do not expect, let us say, a member in the ranks of the American Phytopathological Society, who is automatically a member of AIBS, to regard the latter with as much affection, concern, and loyalty as he does the former. He is first a plant pathologist, second a biologist, and third a scientist. However, we hope he will identify himself with the AIBS, for only as it wins the conscious attention and support of its members will the AIBS grow in strength and influence.

Chemical-Biological Documentation: A New Approach

G. CONGDON WOOD

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THE Problem: A scientific research problem can justify the time, labor and money required to complete it only if it contributes in some degree to man's store of knowledge about his physical, chemical or biological environment. The contribution is often small, and may bear little apparent relation to the original investigations from which it stems.

Most biologists are familiar with situations where weeks or months of the most intensive work on a specific problem have yielded only negative data—interesting, perhaps, but of no immediate value or significance. Such data are all too seldom published; they remain lost and unavailable in laboratory notebooks. Occasionally this kind of hidden information is found, usually accidentally, by a worker in another field, who then proceeds to put it to immediate and significant use.

The first step in any well-ordered scientific investigation is a thorough search of the literature. The investigator must learn which facets of his problem are well known, and which remain to be explored. This approach, of course, is classic. What biologist is not reluctantly resigned to spending tedious, sometimes fruitless hours and days in the library before setting up his first experiment? With limited time and budget he cannot afford the risk of repeating work. Once convinced that he is on a new track, he must have at his fingertips every available bit of information that can help him to plan and carry out his work as effectively as possible. The task of assembling this information is tremendous. With access to even the best library facilities it is often impossible to obtain, or locate certain key references. It may happen that an essential fact lies buried in an obscure journal, and does not come to light until the problem has been completed; knowledge of the fact might well have changed the entire course of an experimental program.

This presents a pessimistic view of scientific documentation; it does not distort the truth. We are all aware of the difficulty of handling to best advantage the rapidly expanding mass of articles, reviews, symposia and books, not to mention the endless unpublished and unindexed reports (which have highly irregular distribution). We must admit that the greatest research by the finest scientific talent is no good at all if someone doesn't make it readily and efficiently accessible to every scientist who could conceivably find in it some measure of inspiration, counsel, or practical help. It has been suggested above that this is not always done. Several writers have commented on the failure of the science of documentation to do its job. Indices, abstracts and reviews have all fallen short of the mark.

Let us now consider an active "experiment in documentation" (Beard, R. L. and K. F. Heumann, Science *116*:553-554 (1952)) and see if the future holds promise of a systematic and successful approach to the dissemination of knowledge.

History. The Chemical-Biological Coordination Center of the National Research Council was established in Washington, D. C. on July 1, 1946. It was a logical outgrowth of the Insect Control Committee of the wartime Office of Scientific Research and Development. From September, 1944 to June, 1946 the Committee was charged with the responsibility of coordinating the work on insect and rodent control problems which was being carried out at the request of the Armed Forces with funds provided by the O.S.R.D.

In 1945 it was decided that the Coordination Center of the Insect Control Committee, under the direction of Dr. C. C. Stock, Executive Secretary of the Committee, would collect, abstract and index all reports and manuscripts concerned with insect and rodent control problems. These data, in the form of Abstract Bulletins, included abstracts of reports prepared for the Armed Forces by its contract investigators, of reports from the various Armed Forces technical laboratories and field stations, and of reports from Allied nations, as well as abstracts of the published literature concerning insect and rodent control matters.

Soon after the end of World War II in 1945, the O.S.R.D. brought its activities to a close. The Insect Control Committee was taken over by the National Research Council, so that its functions could be continued under peacetime conditions.

As a result of the work of this Committee a considerable amount of information had been assembled which concerned the effect of the structure of chemicals upon their insecticidal and rodenticidal activities and upon insect repellency. From 1942 to 1945 more than 8,000 compounds were tested against a variety of insects at the Orlando, Florida, laboratory of the Bureau of Entomology and Plant Quarantine, United States Department of Agriculture ("Results of Screening Tests with Materials Evaluated as Insecticides, Miticides, and Repellents at the Orlando, Fla., Laboratory April 1942 to April 1947," E. F. Knipling *et al.*, U.S.D.A. E-Series, Bulletin 733, 1947). The Food and Drug Administration determined the acute and chronic mammalian toxicity of many of these compounds as well as their skin irritancy. A search for new insecticides became necessary because supplies of pyrethrum and rotenone were cut off by the war. Insect repellents had to be found to protect American troops from insect-borne diseases. Similarly, about 1500 compounds were tested against rats at the Patuxent Laboratory of the Fish and Wildlife Service in a search for new rodenticides to be used as substitutes for red squill, strychnine and thallium which had also become unavailable in the United States.

During the war the O.S.R.D. financed a great deal of additional work which involved the testing of chemicals for various biological activities. Thus, the Board for the Coordination of Malarial Studies sponsored the testing of over 15,000 chemicals for their antimalarial activity ("A Survey of Antimalarial Drugs, 1941-1945," Frederick Y. Wiselogle (Editor), J. W. Edwards, Ann Arbor, Mich., 2 Vols., 1946). Division 9 of the National Defense Research Committee prepared and tested nearly 2,000 compounds. The Tropical Deterioration Center sponsored the testing of a large number of compounds for the control of destructive bacteria, molds and fungi. The Chemotherapy Center for Tropical Diseases sponsored the testing of about 1500 compounds against organisms involved in such parasitic diseases as schistomomiasis, filariasis and amoebiasis. A number of the Armed Forces technical service

laboratories conducted independent searches for compounds possessing other special biological attributes. The Chemical Warfare Service, for example, tested about 2,000 compounds for their action as plant-growth regulators.

Dr. M. C. Winternitz, chairman of the O.S.R.D. Insect Control Committee, conceived the idea of establishing a center which would not limit its efforts merely to the assembly and organization of data concerned only with insect and rodent control problems but would extend its scope to include data involving the broad relationships of chemical structure to biological actions of all kinds. All of the data would be organized according to a system which would insure their ready accessibility. In addition, the published literature would be searched for articles which describe the effect of chemicals on biological systems; these data would be organized for use when required. It was also decided to sponsor a screening program which would permit a great many chemicals to be tested for various biological actions. Along these lines, then, the Center has operated since its inception in 1946. Its major objectives, simply stated, are these:

1. To assemble and organize information which describes (a) the effect of chemicals on biological systems (plants and animals, their organs, tissues cells and cell constituents); (b) the metabolism of test chemicals within biological systems; (c) the mechanism of drug action, or provides information leading to an understanding of such action.

2. To sponsor the preliminary testing (screening) of compounds on a variety of plants, animals and microorganisms to determine the biological effects of the compounds and to make the resulting data available.

Organization. The Chemical-Biological Coordination Center is an operational group within the administrative framework of the National Academy of Sciences—National Research Council. It is responsible to the Executive Board of the National Research Council. The present director of the Center is Dr. Karl F. Heumann. The technical staff consists of scientists trained in the various biological and chemical disciplines. At the present time the biology staff includes specialists in entomology, microbiology, parasitology, pharmacology, physiology and the plant sciences. The Center also trains and employs part time personnel to abstract and code articles assigned to them (by mail) by the permanent staff. The varied interests and backgrounds of all these men and women make it possible for the Center to extend its literature coverage and other activities to nearly every field of biology.

Activities. The Center codes and files data which describe the effects of chemicals on biological systems, and which relate chemical structure to specific biological activity.

These data are obtained from the published literature and from numerous other sources. In addition, the Center sponsors an active screening program, through which sources of new compounds are sought out and the chemicals made available to some 35 screening agencies in the United States, Canada, England, Guatemala and Egypt. New compounds are thus tested systematically to determine their effects on (to mention a few examples) fungi, higher plants, insects and mammals, and on their component organ systems, organs, tissues (including tumors) and cells. The results of all these tests are sent to the Center to be coded and filed, and are periodically published by the National Research Council as Summary Tables.

The information in the C.B.C.C. files is available, free of charge, to accredited scientists. One of the most important of the Center's functions is to answer questions regarding chemical-biological relationships. Only by attempting to answer such questions can the Center test the efficiency of its system and assay the liabilities and assets of its method.

Methods. All of the Center's operations revolve around a unique scheme whereby data are abstracted and recorded in coded form on both code sheets and IBM punched cards for permanent filing. This system depends on two specially devised codes. One of these—the NRC Chemical Code ("A Method of Coding Chemicals for Correlation and Classification," National Research Council, 1950)—offers a method of representing chemical structures by linear symbols. The symbols can be transferred to punched cards, thus allowing the use of machine methods to assist in the correlation of structure with activity. In addition to the symbols for the various chemical families and groups, the code contains detailed instructions for its use, and a number of coded examples. The chemical unit of thought involves a relatively simple problem. Molecular formulas and structural groupings, even of great complexity, readily lend themselves to classification.

Biological activity, on the other hand, being dynamic rather than purely descriptive, is not so easy to classify. Morphological entities, such as organisms, organ systems, organs, tissues and cell types can be catalogued reasonably well. Fundamental actions of a pharmaco-dynamic type, however, are always subject to some sort of interpretation. Different scientific disciplines, such as entomolgy, pharmacology, plant physiology and microbiology use somewhat different terminologies for the same concept or the same word for different activities. For example, is it proper to use the term "carcinogenic" to describe the biological action of chemicals which produce tumors or galls in plant tissue?

It is, therefore, necessary for a suitable biological code to express some measure of compromise in terminology and to be standardized by a set of rules and definitions in order to assure a high degree of uniformity in coding. In studies designed to elucidate the mode of action of chemicals the most specific response is important, but in studies on possible therapeutic agents or practical pesticides, the gross effect or syndrome may be of chief interest. There is certainly no general agreement among investigators as to what constitutes an "effective" compound for a particular purpose. This, therefore, calls for a series of quantitative expressions which will specify, at least to a certain degree, the activity of a particular test substance. Biological variation, especially when further aggravated by uncontrolled variables involved in different test conditions, makes it obligatory for these test conditions to be expressed in some detail.

The code that was finally developed takes into account most of these items and actually serves as a guide to the coder as to what should be coded or left uncoded. The coder must still exercise a certain amount of judgment because of the variety of ways in which biological data may be expressed. This makes it mandatory for the coder to be a person with specialized training in the field in which he is coding, methodical in approach, and sympathetic with the goals to be achieved. The Detailed Biological Code is now in its 6th mimeographed edition. Present plans call for publication of the Code after one more revision.

Results. The end result of applying the chemistry and biology codes to research data is a file of two sets of punched cards which can be searched mechanically for variables, and a file of code sheets bearing the complete written abstract as well as its coded transformation. Although a single criterion can be looked for, it is in the search for combinations of ideas, requiring multiple criteria, where this method has a major advantage over conventional indexes. Thus, compounds having a specified structure which, in stated amounts, induce a given response in a particular organ system of a given group of animals may be selected from all others not meeting the several requirements.

Among the advantages of the C.B.C.C.'s methodology may be mentioned the following:

1. The rapid assembly of information on a multiplicity of ideas in combination and to a degree of selectivity not matched by an existing method.

2. A research tool for the testing of scientific hypotheses.

3. A means for seeking generalities from a limited series of

observations made by many laboratory workers over a number of years and in many research centers.

4. Expedition and facilitation of correlation studies between chemical structure and biological response. Such studies may lead to fruitful predictions.

5. Correlations between one type of biological activity or response and other biological events which may seemingly be unrelated at first glance.

There are, of course, a number of disadvantages to the system outlined above. It is not possible here to discuss the many stumbling blocks which have turned up in the process of coding and checking the data now on file. The files at present contain over 100,000 lines of data describing biological responses to some 45,000 chemicals. While this collection of data is a relatively small one compared to the enormous mass of information which remains unincorporated in the Center's files, it is numerically large enough to point out many flaws, inconsistencies and omissions in the codes and the directions for their application. More important is the fact that with the information now on hand the Center has been able to demonstrate that its approach is a logical one, and its system is workable.

Conclusions. Some account has been given of the objectives, the development and the present status of the Chemical-Biological Coordination Center. Its functions and activities are of significance to all biologists, not alone because of the ever-present possibility of discovering a new chemical with long-sought or needed properties in some area of agriculture or medicine, for example, but because we realize more and more how fundamentally dependent on chemical processes are most if not all phases of biology. The scope of our problem is huge. It presents an undertaking of vast complexity, but this is true of most pioneering ventures. A systematic method has been found for bringing order out of an apparently chaotic mélange of facts and ideas. The raw material is at hand in the voluminous literature of medicine and zoology, of agriculture and botany, of physics and chemistry. We are now sampling some fifty journals, most of them American. There remain as yet unscanned, hundreds of periodicals in English, French, German, Russian, Spanish, Italian, Portuguese, Roumanian, Dutch and a host of other tongues, including the Slavic and Oriental. To date we have surveyed the literature only as far back as 1946. The amount of currently significant chemical-biological information published during the preceding fifty years is staggering. At the present time we are in touch with thirty or forty sources of unpublished data. In how many laboratories and libraries the world over must there be stored samples of new, undeveloped compounds, and reports, manuscripts, theses, notebooks—all gathering dust, when the biological treasures they may contain could be put to immediate use by agencies such as the C.B.C.C., if their very existence were known?

Our problem admittedly poses Herculean tasks, but it is one in which we must all share. So much has been and is being accomplished by fertile, inquiring scientific minds that it would be a prodigal and inexcusable waste of effort which the world can ill afford if we did not thoroughly explore all available means of achieving useful syntheses of this knowledge. The attempt to coordinate and correlate the effects of chemicals on biological systems with the aid of highly specialized codes and mechanical techniques in one approach.

Since the problem is so large, its solution must be cooperative. The job *can* be done; it will be done successfully only with the enthusiastic support of the chemical and biological professions. The C.B.C.C. is committed to a policy of encouraging, publicizing and aiding in research into chemical-biological relationships. There are many practical ways in which chemists and biologists can share in the Center's program. Suggestions as to (1) sources of samples of new, untested compounds, (2) sources of unpublished data, (3) publications known to contain chemical-biological data (particularly little-known periodicals, which may not have come to the Center's attention through the usual library searching channels), (4) comments on the Center's methods and ideas for their improvement—all are not merely welcomed, but urgently solicited.

Through such a concerted effort as has been suggested every working chemist and biologist can take a useful and personally rewarding part in an orderly scheme to unify and relate the various branches of his own particular field, as well as the larger divisions of the life sciences. His achievements will then transcend the confines of a slide mount, a petri dish, a test tube or a printed page, and they will become an integral part of our understanding and control of the phenomena of life.

Summer Conference on College Biology

HARRIET HARVEY

Director, Summer Conference on College Biology,
University of Oklahoma

A SUMMER CONFERENCE on College Biology was held at the University of Oklahoma June 15th through 19th, 1953 under terms of a grant made by the National Science Foundation. More than 50 invited participants represented 34 colleges and universities from the states of Oklahoma, Texas, Arkansas, Kansas, Missouri, Colorado, Arizona, Louisiana and Illinois.

The conference was organized to discuss improvements and modernization of course content of introductory college biology courses on the premise that new research findings and concepts must be assimilated into such courses and the entire course content integrated into an interdigitated and comprehensive whole if the courses are to serve most effectively the purpose of biology in general and best fulfill the needs of future professional scientists.

To this end the eight conference sessions were organized about the common topic, "What are the materials from modern . . . (e.g., embryology) which should be included in introductory college biology courses? How are these materials related to, how do they contribute to and how do they depend upon, comprehension of other fields?" The fields which were discussed were selected to give as broad as possible a cross section of biology and related disciplines in the time available.

The session speakers, chosen for their interest in introductory courses as well as in active research in their special fields were: Embryology, Dr. J. H. Bodine, University of Iowa; Physiology and biochemistry, Dr. Florence Moog, Washington University; Biophysics, Dr. David Pomeroy, Army Medical Research Laboratory, Fort Knox, Ky.; Bacteriology, Dr. Orville Wyss, University of Texas; Genetics and evolution, Dr. L. J.

Stadler, University of Missouri; Taxonomy, Dr. Joseph Ewan, Tulane University; Histology, histochemistry and cytochemistry, Dr. Howard C. Hopps, University of Oklahoma Medical School; Ecology, Dr. Charles E. Olmsted, University of Chicago.

The introductory address of the conference was made by Dr. Harry C. Kelly, Assistant Director for Scientific Personnel and Education, National Science Foundation. Dr. Ralph W. Gerard, University of Illinois Neuropsychiatric Institute, gave the major address of the conference at a dinner for participants and guests. The concluding and summarizing paper was given by Dr. Paul R. David, University of Oklahoma.

Chairmen for the sessions were: Dr. Roy W. Jones, Oklahoma A&M College; Dr. S. H. Wender, Dr. Lawrence M. Rohrbaugh, Dr. J. Bennett Clark, Dr. Laurence H. Snyder, Dr. George J. Goodman, Dr. Richard A. Goff, Dr. Elroy L. Rice, University of Oklahoma.

Complete proceedings of the conference will be published.

Although a detailed summary of the papers presented during the conference and the discussions which followed is impossible here, there were certain points mentioned repeatedly throughout the week that deserve mention for their general interest and importance. The following paragraphs are largely abstracted from the summarizing paper read by Dr. David at the final session.

1. It was noted by one of the speakers that the students who elect biological science as a profession are not the best students as judged by high school grade averages and Army General Classification Scores. Another speaker mentioned the position of low esteem in which biology is held by laymen.

In reference to the first point, several related queries were raised. Do introductory courses fail to give a dynamic picture of biologic phenomena and the high order of imagination and ingenuity required to attack biological problems and thus fail to attract students of the highest intellect? Does biology present a negative approach to the more alert students upon their first introduction to it? Are students led to believe that biology consists of a body of facts which can be mastered by memory and pertinacity?

These questions cannot, of course, be answered categorically but the implied accusation stands that biology courses are in need of serious re-evaluation and reorganization if they are to fulfill their purpose.

It is not to be construed that improvement in introductory courses should be made solely to attract better students into the field. A more far-reaching and vastly more important objective should be the promulgation of certain attitudes, viewpoints and ways of thinking among all those who come in contact with biology as a science, the realization that our collective lives must be ruled by reason rather than by superstition, prejudice or presumed self-interest if society is to progress or, indeed, if society is to survive at all.

There is an advanced reverence in our society for what is called Science but which is not Science at all but Technology, the fruit of scientific research. There is, on the other hand, neither reverence, respect nor recognition of the *method* by which these fruits were obtained. This method should be understood and assimilated into the pattern of our social thinking. Such assimilation, as a contribution to civilization, is one of the major objectives of a biology course.

2. A collective implication of the papers and discussions was that biology courses do not sufficiently utilize cause and effect relationships in the presentation of biologic phenomena. It is in these causal relationships that the dynamism of biology exists and the lack leaves only a stultifying factualism.

Professor Gerard noted that all sciences characteristically pass through four stages during their evolution; a) classificatory, b) static descriptive, c) dynamic descriptive and, d) organismic. While active biological research has, since the turn of the century, become solidly entrenched in the dynamic descriptive and has, in some instances, progressed to the organismic, biology courses and textbooks too often, in whole or in part, linger in the static descriptive stage.

If the teacher of today undertakes to teach biology to uninitiated students without emphasizing the dynamic descriptive or experimental approach and without stressing that the primary function of biology, as of all modern science, is to seek out causal explanations of observed phenomena and not merely to describe those phenomena, he not only fails to give his students any notion of what modern science is, and therefore fails to give any hint of the value inherent in the scientific approach, but he is also guilty of misrepresenting the subject he presumes to teach.

3. The barriers which have been caused to exist between the so-called areas of biology, e.g., bacteriology, physiology, ecology, etc., or between structure and function, must not only be ignored but must be actively transcended. Living organisms must be considered not only in terms of the physics and chemistry of cells or the number of appendages, but in the totality of their evolution, heredity, embryology, physiology, anatomy, ecology and behavior. Structure and function cannot be considered as separate entities but must be recognized as opposite faces of the same phenomenon.

The barriers between the artificially compartmentalized fields have broken down; the interdependence of the fields has become unmistakably clear, and to teach them as inextricably interrelated parts of a whole becomes mandatory.

4. Biology needs to recognize and admit its relationship to, its contributions to and its dependence upon changes and advances in other disciplines. The impact of the sciences of physics and chemistry has been widely credited and now there is need for a like cognizance of the social sciences.

5. In a science as complex, as extensive and as active as biology, the selection of facts and concepts to be introduced into an elementary course becomes a major responsibility. The central problem or problems which are conceived to be involved in every area in an introductory course must be understood and clearly stated to the student. Then, facts, causal relationships and pertinent data may be aligned for his examination and judgment.

The ideals and generalizations outlined above are neither new nor easily achieved. That they were so constantly reiterated reflects the feeling of this conference that they demand recognition, that they have not yet been successfully incorporated into the majority of introductory college biology courses or textbooks, and that their attainment would contribute substantially to the improvement of pre-professional training of all scientists, to the future improvement of biological science by attracting better personnel into the field, and to the overall improvement of modern society.

The conference staff at the University of Oklahoma was comprised of: Dean Glenn C. Couch, Principal Investigator; Dr. Harriet Harvey, Director; Advisory Committee: Dean Laurence H. Snyder, Dean James G. Harlow, Dr. Lawrence M. Rohrbaugh, Dr. J. Teague Self, and Dr. Paul R. David. Miss Virginia Sides represented National Science Foundation at the conference.

The enthusiasm of the conference participants and the multitude of fundamentally important questions raised during the conference, reinforced the conviction of the staff that there is a real and current need for programs of this kind in the field of biology. It is hoped that this conference idea, or a modification of it, may be continued and extended.

May We Introduce You To . . .

Section of Science and Technology Pan American Union

CORTÉS PLA

Chief, Section of Science and Technology,
Department of Cultural Affairs, Pan American Union

DR. SAMUEL L. MEYER, former Director of the AIBS, was kind enough to ask for a report on the activities of the Section of Science and Technology of the Pan American Union. But if the nature and scope of these activities are to be properly understood, we should first explain the history and functions of the Pan American Union.

The origins of the Pan American Union go back to April 14, 1890, when the First International Conference of American States, held in Washington, D. C., from October 2, 1889, to April 19, 1890, decided to establish a bureau "for the prompt collection and distribution of commercial information." That bureau, whose functions had been gradually enlarged in the ensuing twenty years and which was given the name Pan American Union in 1910, was for many years the nucleus around which there grew up an organization of the American countries, the definitive form of which—as a regional agency within the United Nations system—was approved at the Ninth International Conference of American States at Bogotá (Colombia) in 1948.

The Organization of American States is thus the oldest and the newest of international organizations. Since 1948 the Pan American Union, whose seat is in Washington, has been the central and permanent organ and the General Secretariat of the Organization, and contains the technical and information offices. Within our organization special attention has always been given to the exchange of cultural information, and for that purpose the Division of Intellectual Cooperation was set up more than twenty-five years ago in the Pan American Union. Activities in this field began to play a more prominent role, one with greater scope, with the creation of the Department of Cultural Affairs in 1948, and the establishment of the Inter-American Cultural Council, which held its first meeting in Mexico in 1951. It is the Cultural Council that advises on all cultural matters and outlines the program of the Organization in the fields of education, science, and culture.

The Section of Science and Technology, created in 1948, is part of the Division of Philosophy, Letters and Sciences, in the Department of Cultural Affairs; it is charged with carrying out the program prepared by the Inter-American Cultural Council for the promotion of mathematics and the physical and natural sciences. In accordance with that program, the Section publishes *Ciencia y Tecnologia* (Science and Technology), a quarterly bulletin whose first three numbers appeared under the egis of my predecessor, Dr. William D. Crawford, now a member of the Technical and Production Division USAEC, Savannah River Plant (South Carolina). After I became chief of the section, the contents of the bulletin were somewhat changed. In addition to original articles, four sections were introduced: science of today, informational notes, bibliographic notes, and a review of reviews; they deal, respectively, with summaries of advances in the field of science and technology, from nuclear physics to medicine and applied techniques; brief notes reporting on events related preferably with activities of scientists; brief book reviews; and abstracts of articles published in journals. It is, then, a non-specialized publication for specialists: scientists, professionals, students. It tries to disseminate scientific information on a level that will appeal to those who have a certain amount of knowledge of scientific procedure.

To disseminate scientific information on the other level, that is, to appeal to the lay reader, the Section has a monthly scientific and technical information service, consisting of a brief article on a topic of general interest and written so as to be understood by the general reader, and a series of notes on the most important happenings in the fields of science and technology. At present it is being sent to 22 Latin American newspapers and to the UNESCO Department of Natural Sciences in Paris.

We also publish a *Guía de Instituciones y Sociedades Científicas Latinoamericanos*, appearing in parts; so far five, covering 15 Latin American republics, have been issued. The part dealing with Nicaragua, Colombia, and Perú will appear shortly, and we hope to complete the series by the end of 1953. This publication is prepared by Mrs. Christina Buechner, executive secretary of the Committee on International Scientific Publications, who has been under contract to do the work since 1949.

Lastly, the Section issues a series of monographs, the latest of which, *Isótopos como "marcadores" en el estudio del metabolismo de las plantas*, is a translation of an interesting paper by Prof. R. H. Burris, of the Department of Biochemistry of the College of Agriculture of the University of Wisconsin (Madison, Wisconsin).

Moreover, the Section is interested in awakening in the young people of Latin America a love of science, by encouraging them to establish junior science clubs; it supplies information and answers inquiries; it keeps in contact with the divisions of UNESCO having to do with matters in its field; and it is gradually extending its ties with institutions, scientists, and technical experts throughout America.

Other activities that will increase its influence are still in the program stage. We expect to obtain the collaboration of men of science and scientific, industrial, professional, and educational institutions, so that we may extend our sphere of action and be in a position to serve as fully as possible the Pan American ideal with which the work of the OAS is imbued.

Address of Welcome

TO THE MEMBERS OF THE

American Institute of Biological Sciences

University of Wisconsin, Madison, Wisconsin, September 7, 1953.

PRESIDENT E. B. FRED

I AM proud and happy to welcome you to the University of Wisconsin.

Proud, because my life interest has been in the field of biology, and I take pride in showing the University to my fellow biologists. *Happy*, because I am among friends.

You who enjoy the satisfactions of the laboratory can take the word of one who left that happy pursuit. Despite the continual problems and perplexities, despite the occasional need for 24- or 48-hour watchfulness; and perhaps the not-so-occasional feeling that you have lost sight of the forest because of the trees; despite the things that harass you because each of you is an individual possessing at least some rough edges—the reward we find in the laboratory is the reward of the intellectual pioneer exploring new territory and conquering those stubborn foes—stupidity and ignorance.

When I came to Wisconsin many years ago, I was aware that the people of Wisconsin, and particularly those here at the University, still looked upon themselves as pioneers. *Then* it did not come to me, as it does *now*, that scientists are *always* pioneers. And biologists today have a vast region of the unknown to explore.

I should like to say, too, that we of Wisconsin are proud of the share we have had in biological pioneering. The sciences relating to agriculture have always been uppermost in the Wisconsin scene. Much of Wisconsin's development in this field resulted from what the physicists would call a chain reaction. It started when a few early investigators applied fundamental knowledge of nutrition, genetics, and other sciences to our herds, our fields, and our forests. A former Wisconsin president, Charles R. Van Hise, a geologist, wrote one of the pioneer American studies on conservation, published in 1910. We have had dozens of other examples. As you look around at our Wisconsin, I hope you will think how important a few scientific discoveries have been in the history of its development.

I should also like to say that the close integration of the sciences here at Wisconsin has played an important part in our program. We are fortunate in having a number of closely related colleges on a single campus. That physical closeness contributes to the concept that workers in all of the fields of biology are basically biologists, and not primarily specialists in the field with which they are identified by college or department.

I note that the aims of the American Institute of Biological Sciences, as expressed in your constitution, strongly affirm these ideas of unity of effort among all workers in biology, and cooperation with those who labor in related fields.

A fellow biologist has called this "the century of the biological sciences." I am not so sure he was right. There is too much yet to be learned to accomplish our major goals in the years remaining.

This year you are honoring the 50th anniversary of one of your member societies, the horticulturists. Only four other member societies listed in your program are older.

No, I think the biological century is still to come. And it seems to me we should give the doubtful credit for the current century to someone else—the physicists, the chemists, or possibly the engineers.

So instead of calling this the century of biology, let us call it the period in which we biologists have opened our eyes and commenced work.

I should like, for a few moments, to discuss some of the problems I see in this growing science of ours, and give my individual opinions on how they might be attacked.

One of the early Wisconsin biochemists once said that the better the scientist, the simpler the equipment he needs to test his hypothesis; a bent pin, a milk bottle, and a piece of string.

I am sure he was speaking in a figurative sense. Today, certainly, we need adequate equipment, space and supplies. But we need—more than ever—those qualities in our scientists which cannot be bought—namely curiosity, integrity, courage, and the kind of insight which comes from years of experience in the laboratory, the intuitive feeling that tells us that *this* and not *that* pathway will lead us to the answer.

Although I believe that we sometimes seem more interested in apparatus than in output, I realize that the day of the milk bottle and string is gone. Research centers, organized either independently or in connection with educational institutions, certainly have their place. But they also have real dangers.

For basic research, I feel the centers should not become large. Basic investigators are the scouts of science. Once they have turned in their reports, they are useless until sent into new regions. There is a danger that programs of research centers will become static. It is difficult to discontinue or reduce the scope of the work of such centers, and there is always danger of continuing the current program of work, even though it cannot be justified. The larger the center, the more difficult the problem becomes. The center which has a developmental program might very well have to be large, but the need to be large is because of the developmental, rather than the basic, aspect of the research.

Basic research centers which are not intimately associated with educational institutions lose much of their potential value. We must not forget that every laboratory is a potential training ground for young research workers. And the demand today for young scientists is tremendous.

If a closely knit team of scientists is working on an urgent problem, it is no doubt distracting to have to meet the demands of teaching. We have seen, however, during these past years the desperate need we have for new minds sharpened by the disciplines of our sciences. It is the job of the scientific administrator to balance the duties of research and teaching as wisely as he can.

Industry also supports basic research. Unfortunately, industrial support of basic research is sporadic in character. I think we can depend upon the more forward-looking industries to support a certain amount of basic research, but only so long as their applied research programs produce incomes which will carry the cost.

This brings me to another point. In our centers—existing or proposed—I think we must continually ask, are we providing the *utmost* freedom to the curious mind?

We all know that, having left the "Age of the Bent Pin," we are in an era when the importance of research has increased tremendously, and where, we ask, should the financial support rest?

We have two centers of available support—government and private industry. They often play more important roles in the direction of research than the scientist.

Our National Science Foundation, in its report on "Federal Funds for Science" points out:

"Prior to World War II, Federal Government sponsorship of scientific activities was confined largely to . . . research and development in *Government-owned* installations . . . World War II altered this pattern . . . The research partnership between the Federal Government and nonprofit institutions has continued into the postwar period and its scope has grown."

And as someone said, the manner in which federal funds opened laboratory doors was like taking the first olive out of the bottle. Industrial funds followed quickly. Even in the field of agriculture, where federal funds have long been invested in research, industrial funds have increased.

Secretary of Agriculture Benson recently said that "Industry, in fact, now spends more on agricultural research than government does."

Looking over the development of research in the past decades, I would draw at least two rules of thumb to follow in allocating research money.

First, I recommend that funds for basic research should be placed with educational institutions or in the government's own laboratories.

Second, I am convinced that development of applied research can usually be done best in industrial laboratories.

My major concern is that the distribution of the funds shall be made in such a way that the productive work of the curious mind is aided, rather than handicapped; and that the researcher who is also a teacher will be sound in fundamentals instead of over-emphasizing applications.

In fundamental work, the individual investigator must be free to select his problems, his approach, his design, and must be free to shift to another area when he has exhausted the vein he has been working. Only in an environment of freedom can the intellect and ingenuity of the mature investigator give fullest return on our investment.

This does not mean freedom to putter. When I said *mature* investigator I had already safeguarded my statement. One biologist said recently that "Full freedom is not an immutable natural right of all investigators . . . Freedom is predicated upon the exercise of mature judgment by trained minds."

Some young scientists are premature in their demands of freedom. But most of them, I am sure, realize that sometimes freedom results in freedom to make a fool of oneself.

I think most of our young investigators know the value of training in the tenets as well as the techniques of science, and we know that conscientious labor under a mature scientist-teacher will build the intellectual qualities that undergird our whole effort.

The *qualities* of a good scientist *can* be transferred to the younger generation. The existing *knowledge* can be transferred. But if knowledge is to continue to expand, new knowledge must come from new investigators. We take our longest step toward maturity the day we learn something new through our own efforts, by testing our own ideas. Those efforts, those ideas we cannot get from anyone else.

I have tried to show why I believe that capacity for basic research must more and more be a qualification of the good teacher.

There is also much current discussion about the role of sciences in liberal education, and the proper balance between the sciences and the humanities.

Sir Henry Tizard reports a trend in the right direction:

"In spite of our different education and our different aims, humanists and scientists are coming much closer together," he writes.

"Men who are not scientists are beginning to realize that science is the greatest intellectual adventure of our age; that its pursuit stimulates the highest faculties of the human mind; and that its discoveries satisfy the soul in search of beauty."

It is for us, the scientists, to give the world our fullest help, contributing as best we can, to the well-being and happiness of all.

It is our greatest desire that you the members of the American Institute of Biological Sciences find the next few days here at Wisconsin most pleasant and profitable. We are glad to have you with us and we hope you will come back to visit us again.

The University of Wisconsin Meetings

September 6-10, 1953

CLARENCE J. HYLANDER

Convention Director, Bel Air, Maryland

BIOLOGISTS attending the fourth campus meeting of the AIBS societies met on the shores of Lake Mendota under ideal meteorological and sociological conditions, as guests of the University of Wisconsin. The early birds began arriving by plane, train, bus, car and on foot Wednesday evening, September 2. For the next few days, in groups of fifty or more, the various forays and field trips got under way. On Sunday the tempo of arriving biologists increased; by midnight Sunday 2,500 biologists—many with their wives and families—had been housed on or near the campus. Before the close of the sessions the registered attendance reached 2,700, the overall attendance about 3,500, including wives and guests.

Nineteen professional societies and groups participated in the Wisconsin meetings. On the plant side were the American Bryological Society, American Fern Society, American Phytopathological Society, American Society for Horticultural Science, American Society of Plant Physiologists, American Society of Plant Taxonomists, Botanical Society of America, the Potato Association of America, and the Society of Industrial Microbiology. On the animal side were the American Society of Parasitologists and the Society of Protozoologists. Combining the botanical and zoological specialties in common biological areas were the American Microscopical Society, American Society of Limnology and Oceanography, the Biometric Society (ENAR), Ecological Society of America, Society for the Study of Evolution, and the National Association of Biology Teachers. In addition Sigma Xi and Sigma Delta Epsilon participated in the meetings.

A highlight of this meeting was the celebration by the

American Society for Horticultural Science of its fiftieth anniversary. As part of the anniversary program, Sigma Xi and AIBS cooperated in making the Monday evening General Meeting a noteworthy presentation by Dr. E. J. Kraus of Oregon State College on the subject of "Significance of Growth Regulating Substances in Agricultural Practice." Prior to the address, President E. B. Fred of the University of Wisconsin welcomed the biologists to the campus.

A welcoming tea, sponsored by Sigma Delta Epsilon and AIBS, was held in the afternoon in the Great Hall of the Union. This affair provided a pre-meeting opportunity for biologists to greet one another.

Presentation of Technical Papers. As so clearly stated in that scholarly discussion of why people go to scientific meetings, by R. B. Stevens (see "Some Old and Hitherto Fully Described Diseases of Science Meetings," *AIBS Bulletin*, July, 1953), many biologists undoubtedly go either to present or to listen to technical papers. At the Wisconsin meeting 1,140 such papers were presented or listed by title. Leading the field in this aspect were the American Phytopathological Society (173), American Society for Horticultural Science (207) and the Botanical Society of America (278). Many of these presentations were summarized in advance for use by the newspapers, with the result that the press releases issued during the meetings gave the public a good idea of the contributions of biologists to our everyday life. The authors of the papers came from as widely separated places as Nanaimo, British Columbia, and Yonkers; from Cape Town, South Africa, and Urbana; and from Pasadena and Brunswick, Maine.

Symposia. One of the advantages of a joint meeting of various societies concerned with biological problems is the opportunity it presents for sharing in symposia whose subject matter cuts across the traditional biological specialties. Such joint symposia at the Wisconsin meetings were: "The Genetics of Phytopathogenic Fungi in Relation to Basic Problems of Infectious Disease" (American Phytopathological Society and Mycological Society of America); "Photoperiodism" (American Society for Horticultural Science, American Society of Plant Physiologists, Botanical Society of America); "The Mycological Production of Penicillins" (Society of Industrial Microbiology and Botanical Society of America); "Teaching Botany to Undergraduates" (National Association of Biology Teachers and Botanical Society of America). The AIBS jointly sponsored with the Society of Industrial Microbiology a symposium on "Biology and Industry"; representatives from the Monsanto Chemical Company and the Squibb Institute for Medical Research, both AIBS Associates, took part. AIBS also sponsored, together with the American Phytopathological Society, a symposium on "Cooperative Agricultural Research in the Western Hemisphere"; speakers included biologists from Mexico, Canada, Brazil, Argentina, Colombia and Peru as well as from the United States. In addition many societies arranged for individual symposia. Among these were a symposium on Linnaeus, on Modern Methods of Microscopy, on the Training of Conservation Workers, and on Potato Viruses. Disproving the calumny that biologists are a conservative, backward-looking group was the up-to-the-minute symposium of the horticulturists on "The Use of Television in Horticulture."

Field Trips. The locale of the AIBS meetings is unusually well suited for field trips and excursions since the average campus is near natural areas of biological interest. At the Wisconsin meetings some 300 biologists registered for participation in the field trips scheduled by different societies. The American Bryological Society spent Saturday in the Baraboo Hills, and Sunday in the famed Driftless Area. The American Fern Society undertook a field trip to Rocky Arbor State Roadside Park and other dells of interest to fern collectors. On Sunday the American Society of Limnology and Oceanography held a field trip on Lake Mendota. The taxonomists and ecologists joined ranks in a field trip to the University Arboretum and to University Bay on Lake Mendota. The taxonomists also organized an all-day trip to the Wisconsin River region and the ecologists inspected Wisconsin plant communities. The annual foray of the Mycological Society of America was held on Friday and Saturday, with trips to Devil's Lake State Park, the Wisconsin River valley, and the University Arboretum. The parasitologists and protozoologists took their field trip in the gastronomic form of a picnic at Devil's Lake. At the University of Florida, the scene of the 1954 AIBS meetings, it is hoped that many societies will profit from such field trips, taking advantage of the intriguing wealth of the Florida fauna and flora.

Statistics. An analysis of the registration figures of the Madison meeting showed that the biologists in attendance came from every state in the Union except Nevada. Nearly 400 Wisconsonians patronized their home meeting while New York State and Illinois were represented by the second highest number of registrants, 231 each. Michigan (169), Ohio (109), Minnesota (101), Maryland (101), California (99) and Iowa (94) followed in attendance figures. Biologists came from Alaska (2) and Hawaii (6) and Canadians swelled the numbers by 116. Forty-one foreign scientists, from over a dozen different nations, were in attendance.

Registration by society showed that the largest group in attendance was the Botanical Society of America (355), followed by the American Phytopathological Society (320), American Society of Plant Physiologists (296), American Society for Horticultural Science (222) and the Mycological Society of America (120). Over 56 professional scientific societies, American and foreign, were represented in the total registration. 72 percent of the registrants held positions in academic institutions; 17 percent were employed in government or private research laboratories and 11 percent came from industrial concerns.

The Biological Sciences Exhibit Hall has grown to be an integral part of the AIBS meetings. At the Wisconsin meetings the Exhibit Hall was the transformed Rathskeller of the Union, convenient to the refreshment bar as well as to the picturesque terrace overlooking Lake Mendota. New books were brought to the attention of biologists by the booths of the Association of American University Presses, Blakiston Company, William C. Brown Company, Burgess Publishing Company, the Macmillan Company, McGraw-Hill Book Company, C. V. Mosby Company, Prentice-Hall, W. B. Saunders Company and John Wiley and Sons. In addition, the AIBS Biology Library exhibited over 100 books of other publishers, including Dryden Press, Harper and Brothers, Henry Holt, Rinehart Company, Academic Press and Interscience Publishers. Instruments and laboratory equipment were demonstrated by the American Optical Company, Bausch and Lomb, C. A. Brinkman and Company, W. H. Kessel and Company, E. Leitz, and Nuclear Instrument and Chemical Corporation. As in preceding years the Carolina Biological Supply Company had a well-stocked exhibit of botanical and zoological preparations and the American Tobacco Company (with a nostalgic Virginia plantation atmosphere) was on hand to answer questions relative to the tobacco industry. The exhibit Hall opened at noon on Sunday and was continuously the scene of activity until the concluding Smoker, held in the Rathskeller area on Wednesday evening.

THE AIBS Placement Service. Probably the busiest place in the Wisconsin Union, with the one exception of the registration-information desks, was the Placement Service Office. The retrenchment program of many universities and colleges is being felt in the ranks of the young graduating scientists. The usefulness of some liaison service between biologists and prospective employers is unquestionable under these present conditions. During the meetings, the Placement Service staff registered 199 biologists and 21 employers and arranged approximately 96 interviews. An encouraging number of

placements were made and the necessity of taking the AIBS Placement Service to conventions was confirmed.

Press and Public Relations. The AIBS meetings afford biologists an unusual sounding board from which accurate and timely information about the achievements of the biological sciences can be broadcast to the American public. The physicists and chemists have long since discovered the importance, in obtaining public support for their programs, of an effective public relations policy. Far too long biologists have hidden their lights under bushel baskets. At Cornell there was the beginning of a press and publicity room in which the newsmen could get material and make contacts with the biologists. At Wisconsin, thanks to excellent cooperation by the University of Wisconsin News Service, a more adequate arrangement was put into effect. The results were evident in the great number of press releases in the metropolitan newspapers during the period of the meetings.

On the Lighter Side. In the Stevens' article referred to earlier in this report, one of the reasons why people go to conventions was passed over more lightly than it merits: the pleasure and relaxation of being with congenial friends, which also includes making and renewing professional acquaintances. There is no doubt that each succeeding AIBS-sponsored meeting brings a greater number of families, which is as it should be. The younger biologists particularly enjoy bringing their wives and children, thus making the annual scientific event of the man's life coincide with a vacation for his family. Such an opportunity is made even more attractive by the low cost of living and eating at university facilities. Men—you had better prepare some convincing arguments to give your families if you plan to ignore the University of Florida meetings!

It is remarkable, too, how good-natured and agreeable the average biologist remains, in spite of long lines at registration desks and cafeterias, seemingly great distances between dormitories and meeting rooms, and temporary loss of communication with the outside world! The austerity of the visiting scientists often breaks down under the mellowing influence of the academic scene. For example, one biologist, in commenting on the small size of the typed names on the badges, remarked that his wife had decided to print beneath her name "if you can read this you're too close." NOTE: Next year we hope to have the badges typed in PRIMER TYPE! Unusual extra services are often necessary and usually provided, as in the case of the young man who arrived having lost his trousers (out a car window, his extra pair, that is). A young lady of the AIBS staff managed to obtain the loan of a suitably proportioned pair from the assistant director of the Union, so that the young biologist could attend meetings in socially proper attire.

The Biologists' Smoker was an unusually jovial affair this year, attributable in part to the availability of what makes Milwaukee famous. The sporadic showers which began exactly at the time set for the opening of the Smoker on the terrace seemed to have little effect upon the attendance. Amidst the indirect lighting in the leafy canopy of the Terrace the scene assumed a carnival appearance which afforded a light touch to the last evening of the meetings.

Last but not Least, Thanks are Due . . . As in other years, the AIBS-sponsored meetings were organized with the close cooperation of the AIBS staff and the Local Committee on Arrangements composed of representatives selected by each of the participating societies. Close liaison is also required with the university administrative and service departments, especially the housing director, supervisor of the eating facilities, and director of the Union building. It is obvious that a satisfactory joint meeting of over three thousand people taxes the resources of even our largest universities, and requires careful advance planning, and literally thousands of man hours of work. A key figure is the chairman of the Local Committee, in this case Dr. James G. Dickson who also had the responsibility of being president of the American Phytopathological Society; his untiring efforts contributed a major share towards the success of the Wisconsin meetings. The smooth handling of the registration and housing details were the result of the combined efforts of Dr. O. B. Combs and Mr. O. E. Mueller who personally supervised the room assignments during the registration period. Integration of plans for the banquets and special meals was competently handled by Dr. E. W. Hanson, screening and assignment of local personnel was in charge of Dr. H. M. Clarke, transportation problems were solved by Dr. N. S. Fassett, inventory and assignment of meeting rooms were smoothly carried out by Dr. J. F. Crow, visual and audio aids were the responsibility of Dr. J. T. Curtis, and the Biologists Smoker was capably handled by Dr. A. D. Hasler. Publicity and public relations were taken care of by Dr. R. W. Hougas, Mr. Robert Taylor, Mr. James Larsen and the society publicity committees. Mr. Howard Henry, assistant director of the Wisconsin Memorial Union, personally assisted in making all of the Union facilities available for such purposes as registration, press office, placement office, exhibit hall, and smoker. These were the men who carried the ball. However, they were ably assisted by a great number of local men and women who served on their subcommittees, and whose work was unseen but essential for the success of the meetings. To them all, THANKS, on behalf of the Society members who were fortunate enough to be able to enjoy the hospitality of the University of Wisconsin and the officers and staff of the AIBS.

Next year's meetings will be held at the *University of Florida*, Gainesville, Florida; the dates, *September 5 through 9*. The most we can hope for is that this 1954 meeting will be as satifactory and pleasurable as the recent meeting on the shores of Lake Mendota.

SCIENTIFIC REGISTER REPORT

The first questionnaires for the National Scientific Register will be mailed about November 1. A total of some 40,000 questionnaires will be distributed by AIBS to the members of about 34 biological societies, beginning with the Society of American Foresters. Questionnaires will continue to be mailed in society membership units throughout the winter.

Biological Programs at AAAS Boston Meeting

December 26-31, 1953

THE 120th meeting of the American Association for the Advancement of Science will include sessions of all 18 AAAS Sections and of some 60 participating societies and organizations. The programs of interest to biologists will be held almost entirely in Mechanics Building, 111 Huntington Avenue, and in the nearby Sheraton Plaza and Statler Hotels. Details of particular interest to AIBS members follow:

AAAS GENERAL SYMPOSIUM I: SPECIES WHICH FEED MANKIND

Part I. Plant Species. *Dec. 27, morning.*

A. The World's Principal Food Plants. KARL S. QUISENBERRY.

B. America's Principal Food Species: *Zea mays.* PAUL C. MANGELSDORF, EDGAR ANDERSON, O. T. BONNET and MARCUS M. RHOADES.

Part II. Animal Species. *Dec. 27, afternoon.*

A. Agriculture versus Chemistry in the Nutrition of Man. FREDERICK J. STARE.

B. Animal Species. L. A. MAYNARD, S. A. ASDELL, T. C. BYERLY.

AAAS GENERAL SYMPOSIUM II: THE SEA FRONTIER

Part I. *Dec. 29, morning.*

The Origin of Ocean Water. WILLIAM W. RUBEY; Some Recent Results in Geology and Physical Geography of Ocean Basins. W. MAURICE EWING; The Sea as a Productive System. ALFRED C. REDFIELD; Biological Resources of the Sea in Relation to Man. LIONEL A. WALFORD.

Part II. *Dec. 29, afternoon.*

The Edge of the Sea. RACHEL L. CARSON; The Continental Shelf. HENRY C. STETSON; Fresh Water from the Sea. ROBERT V. KLEINSCHMIDT; Shores and Their Sands. FREDERICK K. MORRIS; Making Ore Reserves. ANTOINE M. GAUDIN.

AAAS SECTION B—PHYSICS

Symposium. Physics in Biology. Arranged with the American Society of Naturalists.

Part I. *Dec. 29, morning.* ALEXANDER HOLLAENDER, ERNEST C. POLLARD, BARBARA W. LOW, and CECIL E. HALL.

Part II. *Dec. 29, afternoon.* KURT S. LION, C. W. SHEPPARD, ARTHUR K. SOLOMON, GORDON L. BROWNELL, and BERT L. VALLEE.

AAAS SECTION C—CHEMISTRY

I. Symposium. Comparative Nutrition Requirements of Animal Species. Cosponsored by Sect. N—Medical Sciences and the American Institute of Nutrition. *Dec. 28, morning and afternoon.*

II. Chemicals in Food. *Dec. 29, morning.*

III. Recent Advances in Food Technology. *Dec. 29, afternoon.*

IV. The Chemistry of the Sea as it Relates to Food Problems. *Dec. 30, afternoon.*

AAAS SECTION F—ZOOLOGICAL SCIENCES

AMERICAN SOCIETY OF ZOOLOGISTS

I. Concurrent sessions for papers. *Dec. 28-29, morning and afternoon.*

II. Zoologists' Dinner and Section F, Vice-Presidential Address, "Beauty and the Beast: Life and the Rule of Order" by PAUL WEISS. *Dec. 29.*

III. Presidential Symposium: Bioluminescence as a Tool in the Study of Cell Processes. *Dec. 30, morning.* E. NEWTON HARVEY, AURING M. CHASE, FRANK H. JOHNSON, WILLIAM D. McELROY, JOHN BUCK.

IV. Demonstrations and Zoological Films. *Dec. 30, afternoon.*

V. Round-table Discussion: The Teaching of Physiology at the Undergraduate Level. *Dec. 30, afternoon.*

SOCIETY OF SYSTEMATIC ZOOLOGY

I. Contributed papers. *Dec. 29, morning.*

II. Symposium: The Phoronidea, Bryozoa and Entoprocta, and Brachiopoda: The Status as Phyla and Their Relationships. *Dec. 27, afternoon.* J. C. RATTENBURY, M. D. ROGICK, H. MUIR-WOOD.

III. Symposium. Nomenclature: Results of the Sessions at the Copenhagen Congress. *Dec. 28, afternoon.* R. E. BLACKWELDER, W. I. FOLLETT, C. W. SABROSKY, ERNST MAYR and G. W. SINCLAIR.

IV. Symposium. The Subspecies versus the Cline: Their Biological and Nomenclatural Significance. *Dec. 30, afternoon.* W. H. BURT, C. M. BOGERT, C. G. SIBLEY, T. H. HUBBELL and W. J. CLENCH.

AMERICAN SOCIETY OF HUMAN GENETICS

I. Contributed papers. *Dec. 28-30, morning.*

II. Symposium. Human Genetics and Medical Education. *Dec. 28, afternoon.*

III. Symposium, joint with American Eugenics Society. Genetic Factors Affecting Intelligence. *Dec. 29, afternoon.*

IV. Geneticists' Dinner and Presidential Address by C. P. OLIVER. "The Genetic Population." *Dec. 29.*

V. Symposium, joint with the Genetics Society of America and the Society for the Study of Evolution and Section H—Anthropology. Genetics and the Races of Man. *Dec. 30, afternoon.* W. C. BOYD, Th. DOBZHANSKY, D. C. RISE, P. LEVINE and J. V. NEEL.

AMERICAN SOCIETY OF NATURALISTS

I. Symposium, joint with the Genetics Society of America. Some Biological Effects of Radiation from Nuclear Detonations. *Dec. 28, afternoon.* ALAN D. CONGER, E. B. LEWIS, GEORGE H. MICKEY, ROBERT CARTER, V. P. BOND, JAMES T. BRENNAN, E. P. CRONKITE and WILLIAM L. RUSSELL.

II. Presidential Address by L. J. STADLER, "The Gene."

GENETICS SOCIETY OF AMERICA

I. Contributed papers. *Dec. 28, morning and afternoon.*

II. Invitation papers. *Dec. 29, morning.*

III. Luncheon, Business Meeting and Demonstrations. *Dec. 29, afternoon.*

IV. Contributed papers. *Dec. 30, morning.*

NATIONAL ASSOCIATION OF BIOLOGY TEACHERS

I. Outstanding Techniques and Programs in Conservation Education. *Dec. 27, morning.*

II. Joint program with National Science Teachers Association and American Nature Study Society. *Dec. 28-29, morning.*

III. Panel: Human Conservation. *Dec. 28, afternoon.*

IV. Panel: Biology Classroom Problems. *Dec. 29, afternoon.*

V. Workshop in Conservation Education. *Dec. 31* and *Jan. 1.*

SOCIETY FOR THE STUDY OF EVOLUTION

I. Contributed papers. *Dec. 30, morning.*

AAAS SECTION G—BOTANICAL SCIENCES

I. The Second National Pollen Conference, joint with the Ecological Society of America. Contributed papers and a round-table discussion. *Dec. 28, morning and afternoon, Dec. 29, morning.*

II. Symposium. The Uses of Large-Scale Algal Cultures. Cosponsored by the American Society of Plant Physiologists, New England Section. *Dec. 29, morning and afternoon.* H. W. MILNER, JACK E. MYERS, ROBERT W. KRAUSS, HAROLD B. GOTAAS, W. J. OSWALD, HARVEY F. LUDWIG, DAVIS R. DEWEY, II, A. W. FISHER, DAVID MOWREY and CONRAD YOCUM.

III. Symposium. Growth and Nutrition of Plants. Cosponsored with Section O—Agriculture and Section C—Chemistry. *Dec. 30, morning.* REI ROBBINS, STEPHEN J. TOTH, DAMON BOYNTON, ARTHUR C. FOSTER, R. L. MILLER, G. W. STONER, R. BRADFIELD and L. G. COX.

IV. Contributed papers in general botany; in plant physiology, cosponsored by the American Society of Plant Physiologists, New England Section. *Dec. 28-30.*

V. Botanists' Dinner and Vice-Presidential Address by EDGAR ANDERSON, "The Role of Hybridization in Evolution." *Dec. 28.*

AAAS SECTION H—ANTHROPOLOGY

I. Symposium. Cosponsored with Section I—Psychology. Non-human Primates and the Problems of Human Evolution.

Part I. *Dec. 27, morning.* E. A. HOOTON, GLENN L. JEPSEN, BRYAN PATTERSON, E. L. SCHUMAN, C. L. BRACE, NEIL C. NAPPEN, G. E. ERICKSON, A. S. WIENER and D. D. DAVIS.

Part II. *Dec. 27, afternoon.* C. R. CARPENTER, H. W. NISSEN, H. F. HADDOW, L. J. HAYES and C. HAYES.

AAAS SECTION O—AGRICULTURE

Symposium: Agronomic Problems of the Northeastern States. *Dec. 28-29, morning and afternoon.*

BETA BETA BETA

Luncheon and Biennial Convention. Address by EDMUND W. SINNOTT. "Biology and Teleology." *Dec. 29.*

SOCIETY OF THE SIGMA XI

Annual Address, joint with the AAAS: "The Design and Mechanism of Muscle," by A. V. HILL, past president, BRITISH AAS. *Dec. 27, evening.*

AAAS

Presidential Address by DETLEV W. BRONK and Reception. *Dec. 28, evening.*

Biologists' Smoker. *Dec. 29, 8:30-11:30 p.m.*

The AAAS Annual Exposition of Science and Industry and the AAAS Science Theater, with its showing of the latest foreign and domestic scientific films, again will be features of the meetings. **Coupons for hotel reservations and advance registration will be found in *Science* and *The Scientific Monthly*.**

A.I.B.S. PLACEMENT SERVICE

The AIBS Executive Committee, at its Madison meeting, authorized several changes in the Placement Service. These changes primarily affect fees and the number of lists published. It is hoped that this revision will increase the efficiency of the Service as well as place it on a sound financial basis.

Registrants in the Service will be charged according to the following schedule:

1. A biologist in good standing of an AIBS Member Society ..... $ 2.00 per listing
2. A biologist in good standing of an AIBS Affiliate Society ..... $ 5.00 per listing
3. Any other biologist ..... $10.00 per listing
4. Any biologist, regardless of society affiliation, who wishes "confidential" service, i.e. avail himself of placement services without published listing ..... $20.00 per year

Employers who wish to use the Placement Service will be charged $1.00 for each copy of the placement list. This charge will also be made to an employer who uses the placement lists in the AIBS office.

The Placement Service lists will be published twice a year. One list will appear in December and the second will be published in June.

KNOW YOUR SOCIETIES

AMERICAN GENETICS ASSOCIATION

Total membership: 1,872. **Types of membership:** active, life, honorary. **Dues:** $5.00 per year for members, $7.00 for subscribers. **Journal:** JOURNAL OF HEREDITY. **Officers:** President: Ronald Bamford; Vice-President: H. H. Plough; Secretary: W. E. Heston; Treasurer: Haig Dermen; Editor: Robert C. Cook, 1507 M Street, N. W., Washington, D. C.

The American Breeders Association, which in 1914 became the American Genetic Association, was organized in St. Louis on December 29, 1903. Pursuant to a call issued by the American Association of Agricultural Colleges and Experiment Stations by a special committee, members of that Association interested in the improvement of plants and animals and in studies relating to breeding, met to organize an Association of plant and animal breeders. The moving spirit in organizing the Association was Assistant Secretary of Agriculture under Secretary James Wilson, Professor Willet M. Hays of Minnesota. The organization committee was composed of the following: Professor Willet M. Hays, Chairman; L. H. Bailey, Cornell University; Herbert J. Webber, U.S.D.A.; and Charles F. Curtiss, Iowa Agricultural College. The annual reports of the American Breeders Association were published in seven volumes, from 1905 through 1914.

The American Genetic Association was incorporated in 1913 as a successor to the American Breeders Association. At the time of its reorganization and incorporation Dr. Alexander Graham Bell suggested that the quarterly *American Breeders Magazine* which had begun publication in 1910 be changed to an illustrated monthly. With considerable moral and financial encouragement from Dr. Bell, this venture was undertaken in 1914 at which time the *American Breeders Magazine* became the *Journal of Heredity* and began publication on a monthly basis. The *Journal* continued publication as a monthly magazine (with the exception of some war time doubling up of issues from 1914 through 1919), until 1951. At that time, because of the continuing increase in costs of publication, the frequency of issue was changed to that of a bi-monthly.

Since its foundation the Association has continually grown, and is today the oldest and largest organization in the world devoted to the advancement of genetics. The *Journal of Heredity* has become the leading publication for furthering the interchange of ideas between investigators of different phases of research and for the presentation of their results to the public.

Active membership in the American Genetic Association may be obtained by writing to the headquarters of the Association at 1507 M Street, N. W., Washington 5, D. C. Subject to approval by the Council, any person interested in the improvement of the human race or the creation of better varieties of plants and animals, is eligible for membership. The Association welcomes all who are interested in its program, and the Secretary will be glad to answer all inquiries. All members receive the *Journal of Heredity*, but subscriptions by libraries and other institutions are not eligible for membership.

The annual meeting is held on the second Tuesday in January at the headquarters of the Association.

THE AMERICAN SOCIETY OF ICHTHYOLOGISTS AND HERPETOLOGISTS

Total Membership: about 1,200. **Types of membership:** active, life, honorary, foreign. **Dues:** $5.00 per year for members, $4.50 per year for foreign members, $6.00 per year for subscribers (includes journal). **Journal:** COPEIA. **Officers:** President: Charles M. Bogert; Treasurer: Coleman J. Goin; Secretary: Arnold B. Grobman, Department of Biology, University of Florida, Gainesville, Florida.

The American Society of Ichthyologists and Herpetologists welcomes as members those who are interested in amphibians, reptiles, and fishes or in the general fields of vertebrate zoology, ecology, physiology, or morphology. The Society publishes a quarterly journal, *Copeia*, which has appeared continuously since 1913. Recent volumes have consisted of over 300 pages of original articles on cold-blooded vertebrates that are often illustrated with line drawings and photographs, and occasionally with colored plates. A section on Reviews and Comments covers the more important recent publications in ichthyology and herpetology, and there is an informative section, Notes and News. Membership in the Society includes the privilege of submitting articles for publication. The Society depends upon the dues and contributions of its members to cover publication costs of *Copeia* and has no salaried officers.

Members are invited to attend and participate in the annual meetings which are normally held during a two- or three-day period in April, June or September. The Society has grown so that there is now a western division which has annual independent meetings, but both the parent society and the western division meet jointly about every five years. The meetings are usually devoted to the reading of papers, with, of course, a business session. Most meetings have special events such as field trips, or exhibits of one sort or another. The Society is especially proud of its revolving research fund from which grants are made to young investigators to enable them to finance research or trips that they would not ordinarily be able to make. Through the generosity of one of its members, an annual prize is offered for the best student paper in herpetology and in ichthyology. The Society normally contributes to the support of the *Zoological Record*. The American Society of Ichthyologists and Herpetologists meets frequently with the American Society of Mammologists, since members of both organizations have a fairly broad common core of interest.

POULTRY SCIENCE ASSOCIATION

Total membership: approximately 1,000. **Types of membership:** active, associate, life, honorary. **Dues:** $6.00 per year for active membership (includes journal). **Journal:** POULTRY SCIENCE. **Officers:** President: H. J. Sloan; First Vice-President: J. R. Cavers; Second Vice-President: O. E. Goff; Secretary-Treasurer: T. B. Avery, Kansas State College, Manhattan, Kansas.

The Poultry Science Association was organized in 1908. The objective of the Association is the advancement of poultry husbandry throughout the United States and Canada, especially as it related to the profession of teaching, both resident and extension, and research.

Four types of membership exist: active, associate, life and honorary. Active members are persons who are regularly engaged in some phase of the poultry industry and who have made definite contributions to knowledge in the industry. Associate members are persons engaged in some phase of the poultry industry but not regularly employed by an educational or research institution or a state (or provincial) or federal governmental department. Life membership is available to any active member in good standing at the age of seventy years; dues are then exempted but rights of active membership are retained. Honorary members are elected by the membership, on recommendation of the Executive Committee, from individuals who have made special contributions to the advancement of the welfare of the Association. Honorary and associate members have all the rights and privileges of

the Association except those of voting and holding office. Active members are elected by a majority vote of the members present at any annual meeting, upon written application endorsed by three active members and approved by the Executive Committee.

Annual membership dues are $6.00 and this includes receipt of the Journal, *Poultry Science*, which is published bimonthly. The subscription price of the journal to nonmembers is $8.00 per year. There are approximately 1,500 non-member subscribers. Annual meetings are held on the campus of a college or university in Canada or the United States.

SOIL SCIENCE SOCIETY OF AMERICA

Total membership: 1,120. **Types of membership:** active, associate, corporate, student affiliate. **Dues:** Determined by majority vote at annual meetings upon recommendations of the Executive Committee. **Journal:** SOIL SCIENCE OF AMERICA PROCEEDINGS. **Officers:** President: Eric Winters; Vice-President: Emil Truog; Past President: L. A. Richards; Secretary: L. G. Monthey, 2702 Monroe Street, Madison 5, Wisconsin.

The Soil Science Society of America was organized November 17, 1936, when the American Soil Survey Association and the Soil Section of the American Society of Agronomy voted to merge. A desire to eliminate the serious overlapping and duplication of activities between the older organizations was responsible for the decision.

The prime objective of the Soil Science Society of America, then as now, is to "foster all phases of fundamental and applied soil science." These objectives are carried out by means of national and regional meetings, special conferences, and the official organ *Soil Science Society of America Proceedings*, a quarterly scientific journal.

The Soil Science Society of America was incorporated as a nonstock corporation under the laws of Wisconsin, as of January 22, 1952. It functions as the Soil Science Division of the American Society of Agronomy, and it maintains its central office with the latter organization. S.S.S.A. annual meetings, without exception, have been held jointly with those of the American Society of Agronomy.

The professional groups in the Soil Science Society of America are designated as divisions and subdivisions as follows: I. Soil Physics; II. Soil Chemistry; III. Soil Microbiology; IV. Soil Fertility, Fertilizers and Plant Nutrition (Subdiv.) IV(a) Organic Soils; V. Soil Genesis, Morphology and Classification (Subdiv.) V(a) Forest Soils; VI. Soil Conservation, Irrigation, Drainage and Tillage.

Any person or organization interested in the objectives of the S.S.S.A. is eligible for membership, with no educational or research requirements. Members interested in a particular field of soil science not falling into its divisional structure may organize a subdivision of the S.S.S.A., which shall be granted permanent status if favored by an affirmative vote of two-thirds of the Society's active members, voting in a mail ballot.

Although dedicated primarily to scientific research in the field of soil science, the Society is actively promoting individual achievement and high professional standards in its particular field. In this sense, it is a professional society as well as a scientific organization.

1954 AIBS MEETINGS
University of Florida
Gainesville, Florida
September 5–9

The voices of 10 birds and 6 frogs as you have never heard them before!

MUSIC AND BIRD SONGS

Commentary and analysis by James H. Fassett, Supervisor of Music, CBS Radio

Unsuspected melodies of nature are revealed by reducing the natural speed of some of the bird songs that have been recorded by Dr. Kellogg. Mr. Fassett's interpretive analysis adds much to the listener's appreciation of this record. "Highly recommended for the entire family."—*Christian Science Monitor.*

You hear: *Mockingbird, Winter Wren, Common Loon, Pied-billed Grebe, Eastern Meadowlark, Red-winged Blackbird, Western Meadowlark, Song Sparrow, Swamp Cricket Frog, Spring Peeper, Cricket Frog, Bullfrog, Southern Toad, Barking Frog, Wood Thrush, Hermit Thrush.*

10-inch vinylite record, 2 sides, 33-1/3 rpm
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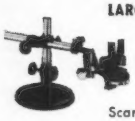

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